

**UNITED STATES AIR FORCE
ARMSTRONG LABORATORY**

**Demonstration of Radio-Frequency Soil
Decontamination: KAI Technologies
Demonstration (Volume III of III) Part 2:
Pages 230-360**

Gilbert B. Avila, David L. Faust, Raymond S. Kasevich, and
Steven L. Price

KAI Technologies, Inc.
Eastern Office and Laboratory
170 West Road, Suite 7
Portsmouth, New Hampshire, 03801

December 1996



19970714 092

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EnviroNics Directorate
Environmental Risk Management
Division
139 Barnes Drive
Tyndall Air Force Base FL
32403-5323

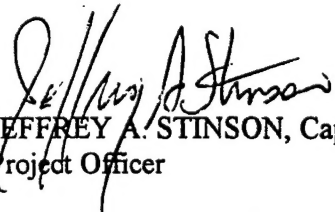
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This report has been reviewed and is approved for publication.


JEFFREY A. STINSON, Capt, USAF, BSC
Project Officer


ALLAN M. WEINER, Lt Col, USAF
Chief, Site Remediation Division

DRAFT SF 298

1. Report Date (dd-mm-yy) August 1996		2. Report Type Final		3. Dates covered (from... to) June 1992 to December 1994	
Title & subtitle Demonstration of Radio Frequency Soil Decontamination: Vol III, KAI Technologies, Inc. Demonstration (Vol III of III)				5a. Contract or Grant # F33615-90-D-4011	
				5b. Program Element # 78008F	
6. Author(s) Gilbert G. Avilla, David L. Faust, Raymond S. Kasevich, and Steven L. Price				5c. Project # 3788	
				5d. Task #	
				5e. Work Unit # 3073	
7. Performing Organization Name & Address KAI Technologies, Inc. Eastern Office and Laboratory 170 West Road, Suite 7 Portsmouth, NH 03801				8. Performing Organization Report #	
9. Sponsoring/Monitoring Agency Name & Address Armstrong Laboratory Environics Directorate Site Remediation Division 139 Barnes Drive, Suite 2 Tyndall Air Force Base, FL 32403-5323				10. Monitor Acronym USAF	
				11. Monitor Report # AL/EQ-TR-1996-0040	
12. Distribution/Availability Statement Approved for public release. Distribution unlimited.					
13. Supplementary Notes					
14. Abstract The Air Force Armstrong Laboratory, Tyndall Air Force Base, Florida, has supported the research and development of Radio Frequency Soil Decontamination. Radio frequency soil decontamination is essentially a heat-assisted soil vapor extraction process. Site S-1 at Kelly Air Force Base, Texas, was selected for the demonstration of two patented techniques. The site is a former sump that collected spills and surface runoff from a waste petroleum, oils, and lubricants and solvent storage and transfer area. In 1993, a technique developed by the ITT Research Institute using an array of electrodes placed in the soil was demonstrated. In 1994, a technique developed by KAI Technologies, Inc. using a single applicator placed in a vertical borehole was demonstrated. Approximately 120 tons of soil were heated during each demonstration to a temperature of about 150 degrees Celsius.					
15. Subject Terms Radio Frequency Soil Heating, Soil Vapor Extraction					
Security Classification of			19. Limitation of Abstract Unlimited	20. # of Pages 513	21. Responsible Person (Name and Telephone #) Capt Jeffrey A. Stinson (904) 283-6254
16. Report classified	17. Abstract Unclassified	18. This Page Unclassified			

PREFACE

This report was prepared by Halliburton NUS Environmental Corporation, 800 Oak Ridge Turnpike, Oak Ridge, TN 37830 under contract F33615-90-D-4011 for the Armstrong Laboratory Environics Directorate (AL/EQW) (formerly the Air Force Engineering and Services Center), Tyndall AFB, FL 32403-5323.

This final report summarizes the project's Phase I efforts for a field demonstration of the IIT Research Institute's (IITRI) tri-plate capacitor and the KAI Technologies, Inc.'s (KAI) antenna radio frequency heating (RFH) techniques for the enhancement of soil vapor extraction (SVE) for the in situ decontamination of soils.

The work was performed between June 1992 and December 1994. The AL/EQW technical project officers were Mr. Paul F. Carpenter (during the initial stage of the project) and Capt Jeffrey A. Stinson (during the latter stage of the project).

EXECUTIVE SUMMARY

The United States Air Force developed the Installation Restoration Program to assess past hazardous waste disposal and spill sites and prepare remedial actions consistent with the National Contingency Plan for those sites that pose a threat to human health or the environment. Within that program the Site Remediation Division of the Environics Directorate of the Air Force's Armstrong Laboratory at Tyndall AFB, Florida, has supported the research and development of Radio Frequency Soil Decontamination.

Armstrong Laboratory was sufficiently encouraged by the early test results in sandy soils at Tyndall AFB, Florida, and Volk Field, Wisconsin, to pursue larger-scale demonstrations in tight soils that are more difficult to treat. In September 1991, the Air Force Center for Environmental Excellence at Brooks AFB, Texas, contracted Halliburton NUS Environmental Corporation (now Brown & Root Environmental) to conduct pilot scale demonstrations of two different, patented, radio frequency heating techniques at Site S-1 at Kelly AFB, Texas.

The project was divided into three phases the Preplanning Phase, Phase I, and Phase II. The Preplanning Phase, completed in September 1992, included literature review, conceptual cost estimations, design plans and specifications preparation and review, and publication of a final report documenting the results. Phase I included two integrated pilot tests and the preparation of this final technical report evaluating the results of Phase I and the conceptual planning of Phase II. Phase II will include the complete planning and design of a full-scale commercial demonstration of radio frequency soil decontamination.

Radio frequency soil decontamination is essentially a heat-assisted vapor extraction process. Radio frequency energy applied to the soil causes polar molecules, including water and many organic compounds, to vibrate. This vibrational energy is lost as heat. The resulting rise in soil temperature vaporizes both water and contaminants, which may then be removed by application of a vacuum. Extracted vapors may be treated by a variety of methods, depending on the site and the nature of the contaminants. Vapors extracted during the demonstrations at Site S-1 were burned in a flare.

Two types of radio frequency soil heating were demonstrated at Site S-1 from January to August 1993 and 1994. In 1993, a technique developed by the IIT Research Institute that uses a series of exciter and ground electrodes placed in the soil was demonstrated. This technique was tested previously at Air Force sites. In 1994, a technique developed by KAI Technologies, Inc. which uses

an antenna-like device that may be placed in a vertical or horizontal borehole was demonstrated. Halliburton NUS Environmental Corporation provided site preparation services, the vapor extraction system, and supervised and coordinated all other aspects of the demonstrations.

Armstrong Laboratory, Kelly AFB, and the US Department of Energy have contributed funds and guidance for the work completed to date which includes the Preplanning Phase and Phase I. In addition, the Phase I demonstrations are part of the US Environmental Protection Agency's Superfund Innovative Technology Evaluation Program.

Halliburton NUS Environmental Corporation concludes that data gathered during the pilot demonstrations is invaluable to the development of radio frequency heating for the enhancement of soil vapor extraction and can be used to design a commercial scale system and implement remedial activities in accordance with United States Air Force procedures. From lessons learned during the Site S-1 demonstrations, criteria for technology implementation have become apparent that allow the selection of a site better suited to the unique physical and chemical phenomenon inherent in the process. To date only six field tests have been completed. These tests have addressed situations with a wide variance of soil and contaminant characteristics. A phased approach is recommended which would include more demonstrations to plug data gaps and define unknowns followed by commercial scale application. A smaller site with a simpler (more homogenous) soil and contaminant matrix, relative to Site S-1, would simplify the evaluation of results and better define technology applicability.

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FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

F3

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow stem Auger 4 1/4" ID

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 23

TIME STARTED 1215

DATE 1/15/94

TIME COMPLETED 1306

DATE 1/15/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Dry

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Partly Cloudy, upper 60°F, moderate east wind

SURFACE ELEVATION

COMMENTS

Gravel

4-6 Clay, slightly silty, w/ gravel, concrete frags, dry to sl. moist, FILL

#2 liner - regular

SAMPLER TYPE
FEET DRIVEN
FEET RECOVERED
SAMPLE CONDITION
FIELD LABORATORY SAMPLE NUMBER
FIXED LABORATORY SAMPLE NUMBER
HPT SCAN OVA
(PPM)
LITHOLOGIC CODE
DEPTH (FEET)

1
2
3
4
5
6
7
8
9

3 SP 2.0 1.5 good KRF-F3 40406 0 221



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Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Testing

F2

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger 4 1/2" ID

DRILLERS NAME: John Falbert

TOTAL DEPTH (FT.): 27.5

TIME STARTED 0958

DATE 1/15/94

TIME COMPLETED 1110

DATE 1/15/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Partly Cloudy, to 60°F, light east wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE
FEET DRIVEN
FEET RECOVERED
SAMPLE CONDITION
FIELD LABORATORY SAMPLE NUMBER
FIXED LABORATORY SAMPLE NUMBER
HNU SCAN (PPM)
LITHOLOGIC CODE
DEPTH (FEET)

1
2
3
4
5
6
7
8
9

Gravel



SHEET 1 OF 2

PROJECT

BORING NO.

RF Heating

F

JOB NO. 3688

LOGGED BY: B D H

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile 8-53

DRILLING METHOD: *Hollow Stem Auger 4 1/4" ID*

DRILLERS NAME: John T. Elliott

TOTAL DEPTH (FT.) 23

TIME STARTED 0814

DATE 1/15/94

TIME COMPLETED 0937

DATE 1/15/94

**GROUND-WATER CONDITION AT
COMPLETION OF DRILLING**

Not

**BACKFILLED,
TIME**

DATE _____

WEATHER CONDITIONS

Partly cloudy, upper 30 °F, slight NW wind

**SURFACE
ELEVATION**

COMMENTS

[illegible]

3" 59 1.5 0.7

NYF-FI-0076
2822 4

4.5.5' Clay, silty, w/ gravel, wood frags,
sh. lvs, roots, FILL
#1 liner - random

75 blows for 1.5' driven, driller
reports on zone



FIELD LOG OF BORING

SHEET 1 OF 2

DI LÀN

PROJECT

BORING NO.

RF Heating

E 8

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger 4 1/4"

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 28

TIME

TIME STARTED 0925

DATE _____

DATE 1/18/94

TIME

TIME COMPLETED 105

DATE _____

DATE 11/18/94

GROUND-WATER CONDITION AT
COMPLETION OF DRILLING

Wet, water at ~ 25'

BACKFILLED. TIME

DATE _____

WEATHER CONDITIONS

Partly cloudy, to 40°F, strong NE wind, gusty

**SURFACE
ELEVATION**

COMMENTS

[illegible]

1
2
3
4
5
6
7
8
9
10

3"
SP 2.0 1.6 ~~2.0~~

KRF-E8-40608
2
093

6-8' Clay, silty, w/ gravel, dk br,
sl. moist, FILL

#2 linear - regular



FIELD LOG OF BORING

SHEET: 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

E7

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 14

TIME STARTED 1600

DATE 1/13/94

TIME COMPLETED 1645

DATE 1/13/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Dry

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Partly Cloudy, upper 60's, NE wind

SURFACE ELEVATION

COMMENTS

Gravel at sfc.

2'-4' (clay, silty, w/gravel)
light br to red br, moist

#2 liner - regular

SAMPLER TYPE
FEET DRIVEN
FEET RECOVERED
SAMPLE CONDITION
FIELD LABORATORY SAMPLE NUMBER
FIXED LABORATORY SAMPLE NUMBER
HND SCAN OVA (PPM)
LITHOLOGIC CODE
DEPTH (FEET)

3"	SP	20	1.6	Good	TRF-E7-40204	32	1604	1
								2
								3
								4
								5
								6
								7
								8
								9
								10



FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

E6

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: John Tallon

TOTAL DEPTH (FT.) 22

TIME STARTED 1350

DATE 1/14/94

TIME COMPLETED 1443

DATE 1/14/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Dry

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Fair, upper 60°F, mod. SW wind

SURFACE ELEVATION

COMMENTS

Gravel

SAMPLER TYPE

FEET

DRIVEN

FEET

RECOVERED

SAMPLE

CONDITION

FIELD LABORATORY

SAMPLE NUMBER

FIXED LABORATORY

SAMPLE NUMBER

HAND SCAN

DVA

(PPM)

LITHOLOGIC

CODE

DEPTH

(FEET)

3"

SP

2.0

1.9

Good

KRF-E6-40810

2

1358

235

Clay, silty, sdy, w/ gravel, the br, moist, FILL

#2 liner - regular



SHEET: 1 OF 2

BORING NO.

E5

1 LOGGED BY: BDIH

1 EDITED BY:

DRILL RIG TYPE: *mobile* *B-53*

DRILLING METHOD: Hollow Stem Auger 4 1/4"

DRILLERS NAME: John Tallot

TOTAL DEPTH (FT.) 22

TIME STARTED 1355 DATE 1/17/94

TIME COMPLETED 1523 DATE 1/17/94

**GROUND-WATER CONDITION AT
COMPLETION OF DRILLING**

BACKFILLED.	DATE
TIME	

WEATHER CONDITIONS

Partly cloudy, upper 50's F, strong NE wind

**SURFACE
ELEVATION**

COMMENTS

SAMPLER	TYPE	FEET	DRIVEN	FEET	RECOVERED	SAMPLE	CONDITION	FIELD LABORATORY	SAMPLE NUMBER	FIXED LABORATORY	SAMPLE NUMBER	HNU SCAN	(PPM)	LITHOLOGIC	CODE	DEPTH	(FEET)
---------	------	------	--------	------	-----------	--------	-----------	------------------	---------------	------------------	---------------	----------	-------	------------	------	-------	--------

					1
					2
					3
					4
" 3 SP	2.0	1.7	Pass	4 1404	5
3'' SP	2.0	1.2	Pass	14 1408	6
					7
					8
					9
					10

236

#2 liver - regular



SHEET: 1 OF 2

BORING NO.

E4

LOGGED BY: BDH

EDITED BY:

DRILL RIG TYPE: *Model 2 B-53*

DRILLING METHOD: *Hollow Stem Auger 4 1/2" ID*

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 24

TIME
STARTED 1006

DATE 1/17/94

TIME COMPLETED 1208

DATE 11/17/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME

DATE _____

WEATHER CONDITIONS

Partly Cloudy, to 50°F, strong 15-20 mph N wind
SURFACE

**SURFACE
ELEVATION**

COMMENTS

Gravel at sfc

3' Large gravel or coarse

6'-7' On hard obstruction, cannot
drive split spoon, use wedge
and downhole hammer to break
through obstruction, no sample due
to poor recovery

7'-9' clay, s/s, sand, gravel, med.
br, slight hydrocarbon odor

SAMPLER	
TYPE	
FEET	
DRIVEN	
FEET	
RECOVERED	
SAMPLE	
CONDITION	
FIELD LABORATORY	
SAMPLE NUMBER	
FIXED LABORATORY	
SAMPLE NUMBER	
TRU SCAN	07A
(PPM)	
LITHOLOGIC	
CODE	
DEPTH	
(FEET)	

Hand-drawn geological log on a grid. The log shows two soil samples. Sample 1 is at 0.3m depth, labeled 'Poor' and '1055'. Sample 2 is at 2.0m depth, labeled 'Good' and '1055'. The log also includes a scale on the right side from 1 to 6 meters.

Depth (m)	Soil Description	Notes
0.3	Poor	1055
2.0	Good	1055



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Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

E3

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger 4 1/4" ID

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 29.0

TIME STARTED 1542

DATE 1/17/94

TIME COMPLETED 1754

DATE 1/17/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Wet

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Partly Cloudy, mid 60°F, strong NE wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE

FEET

DRIVEN

FEET

RECOVERED

SAMPLE

CONDITION

FIELD LABORATORY

SAMPLE NUMBER

FIXED LABORATORY

SAMPLE NUMBER

HNU SCAN

(PPM)

LITHOLOGIC

CODE

DEPTH (FEET)

1
2
3
4
5
6
7
8
9



HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

E2

JOB NO. 36880

LOGGED BY: BOH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger 4 1/4"

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 28.0

TIME STARTED 1228

DATE 1/18/94

TIME COMPLETED 1402

DATE 1/18/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE
FEET DRIVEN
FEET RECOVERED
SAMPLE CONDITION
FIELD LABORATORY SAMPLE NUMBER
FIXED LABORATORY SAMPLE NUMBER
HNU SCAN (PPM) OVA
LITHOLOGIC CODE
DEPTH (FEET)

3" SP

2.0

1.0

Fair

KRF-E2-W0002
1233 8

1

2

3

4

5

6

7

8

9

239

0' - 0.3' Gravel, silty, light br
0.3' - 2.0' Silty, clayey, w/ gravel.
2" chunk of asphalt in shoe, dr br,
dry, FILL
#1 liner - regular

FIELD LOG OF BORING

 SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

E1

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 24.6

TIME STARTED 0804

DATE 1/14/94

TIME COMPLETED 1100

DATE 1/14/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Dry

 BACKFILLED.
TIME

DATE

WEATHER CONDITIONS

Fair, sunny 30°F, slight breeze

SURFACE ELEVATION

COMMENTS

0'-0.4' Gravel at surface

0.4' - 2.0' Silt, clayey, silty gravel, med ln to blk ln, Fe stained, dry #2 liner regular

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HMJ SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	2.0	Good		HMJ-E1-40002	HMJ 1100		1
						0816		2
								3
								4
								5
								6
								7
								8
								9
								10
								11
								12
								13
								14
								15
								16
								17
								18
								19
								20
								21
								22
								23
								24



FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

A2

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger 6 1/4" ID

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 27.2

TIME STARTED 1009

DATE 1/12/94

TIME COMPLETED 1225

DATE 1/12/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED. DATE

WEATHER CONDITIONS

Overcast, upper 50s°F, NE wind - moderate

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE
FEET DRIVEN
FEET RECOVERED
SAMPLE CONDITION
FIELD LABORATORY SAMPLE NUMBER
FIXED LABORATORY SAMPLE NUMBER
HAWK SCAN (PPM) OVA
LITHOLOGIC CODE
DEPTH (FEET)

3"	SP	2.0	1.5	Good	KRF-A2-40002	5	1
3"	SP	2.0	1.5	Good	KRF-A2-40204	0	2
3"	SP	2.0	0.9	Good	KRF-A2-40406	0	3
							4
							5
							6
							7
							8
							9
							10

0'-0.5' Gravel fill
0.5'-2.0' Fill, silt, clayey, w/ gravel, yellowish br to med. br, dry #2 liner - regular
2'-4' Silt, clayey, plastic, wire, w/ gravel, FILL, #2 liner - regular
4'-6' clay, silty, w/ gravel, copper wire, metal, wood, med. br, moist. #2 liner - regular



FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

PF Heating

A1

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 28'

TIME STARTED 1630

DATE 1/11/94

TIME COMPLETED 1845

DATE 1/11/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Dry

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Partly Cloudy, mid 60's, mod. wind in

SURFACE ELEVATION

COMMENTS

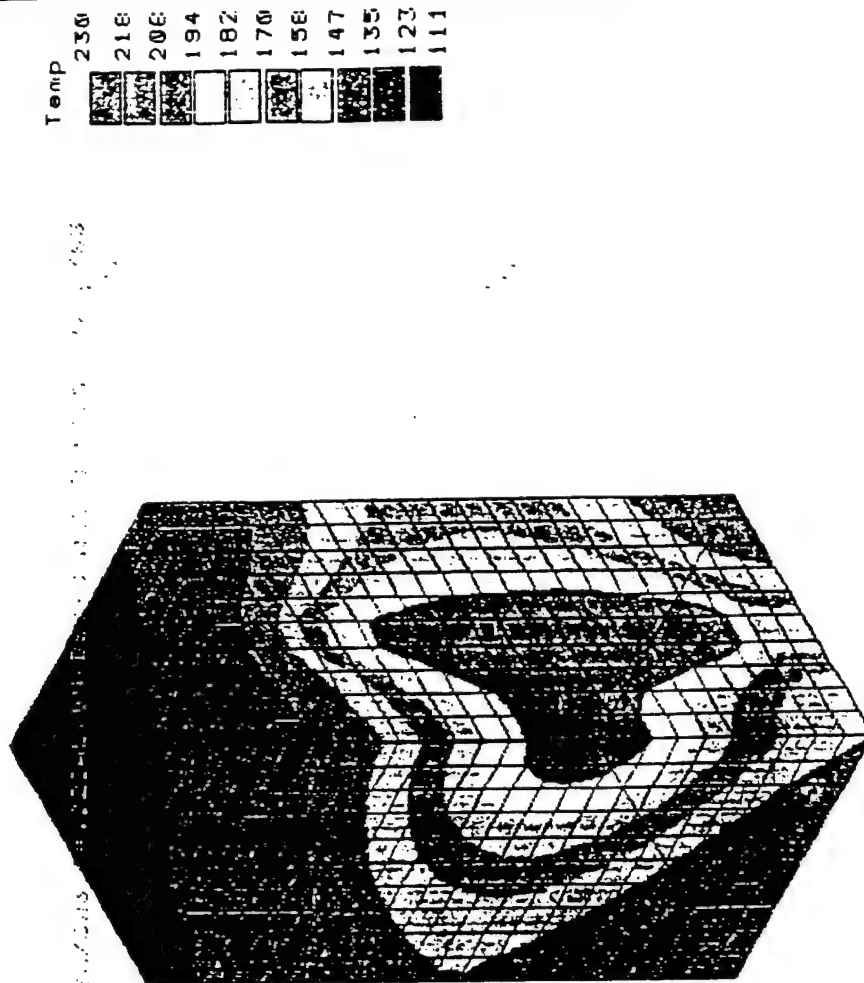
Gravel @ 28'

Fill: clay, gravelly, dark brown, dry

#1 liner for analysis

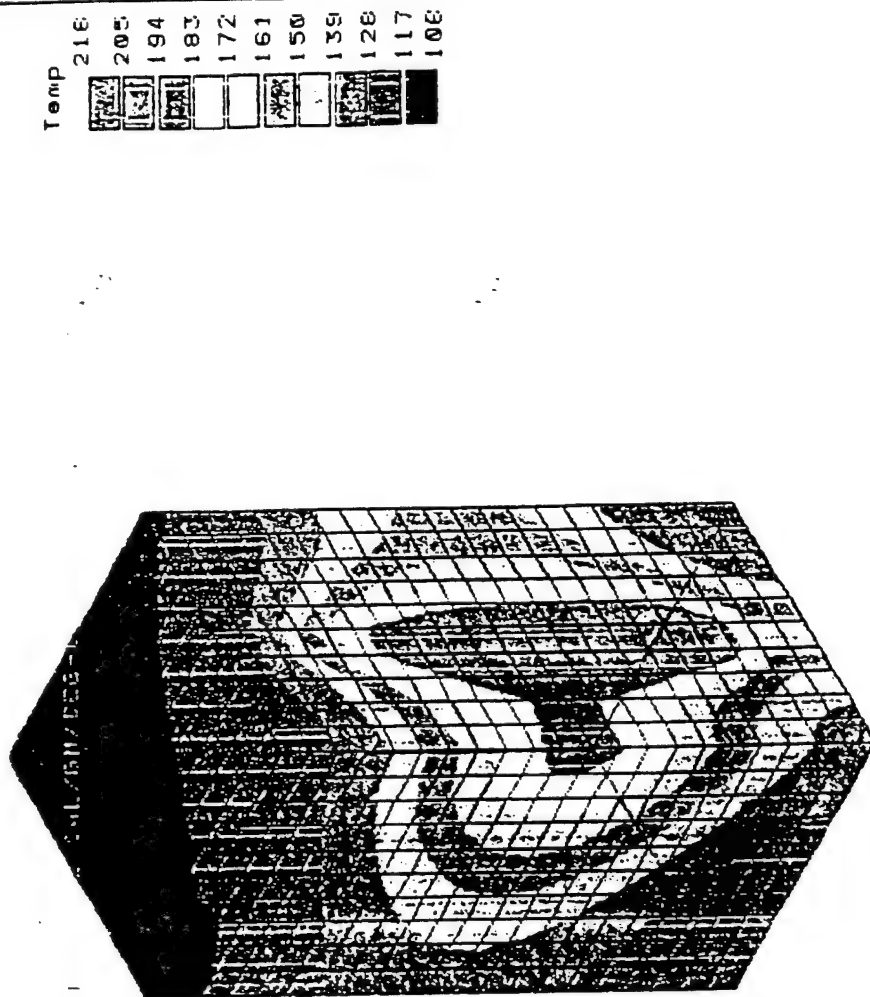
SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HH SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" GP	2	1.1	Good	1645		0		

THERMAL Step=60



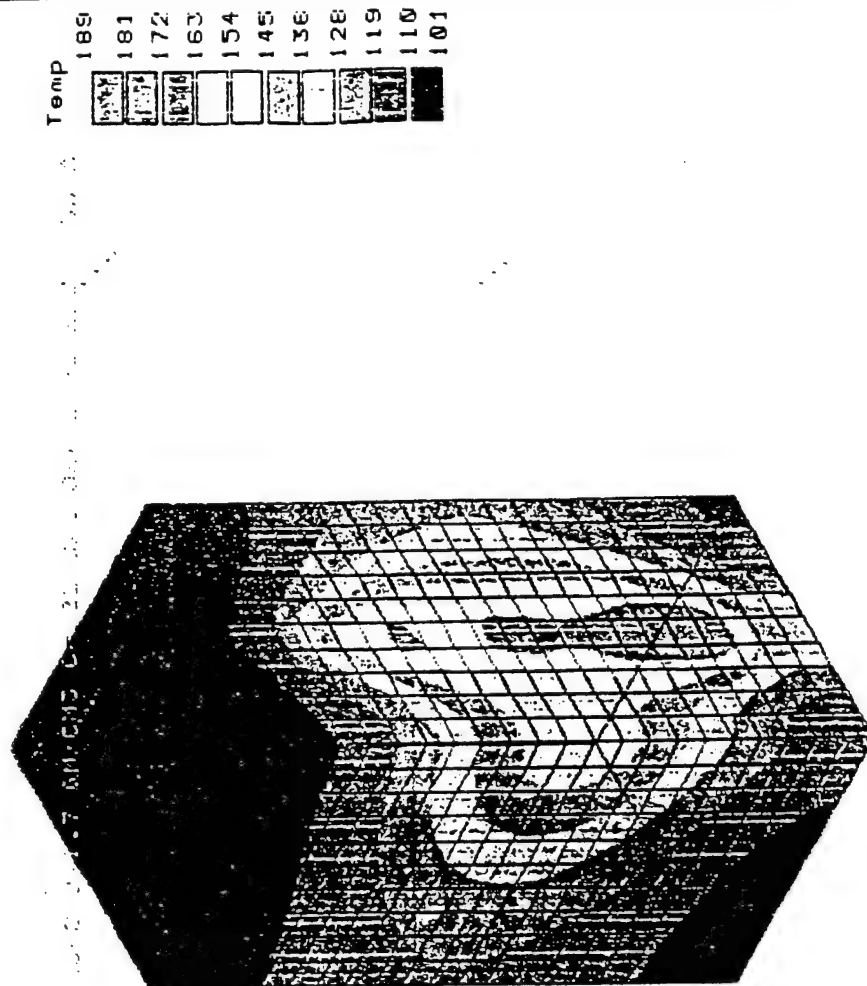
DBL.G15 Dual Applicators Temperature Profile - After 30 days of RF heating

THERMAL Step=46



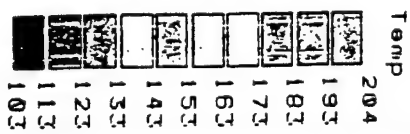
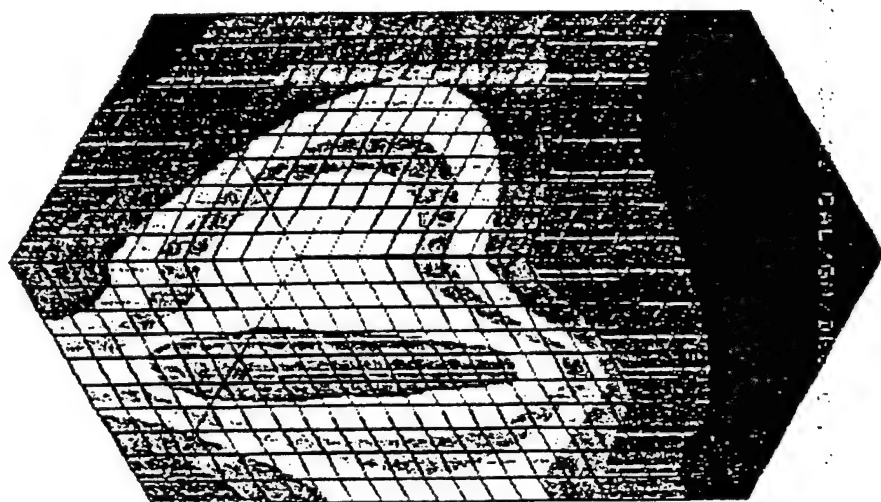
DBL.G13 Dual Applicators Temperature Profile - After 23 days of RF heating

THERMAL Step=22



DBLG11 Dual Applicators Temperature Profile - After 11 days of RF heating

THERMAL Step=34



DBL.G12 Dual Applicators Temperature Profile - After 17 days of RFL heating

SHEET 2 OF 2

BORING NO.

A1

27'-28' gravel, silty, yellowish in
~~to to~~

247

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	DOYA	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	2.0	Good	KRF-A2-U101	1045	360		11
3" SP	2.0	2.0	Good	KRF-A2-U102	1058	80		12
								13
								14
								15
3" SP	2.0	1.8	Good	KRF-A2-U103	1107	300		16
								17
								18
								19
3" SP	2.0	1.6	Good	KRF-A2-U104	1123	420		20
								21
								22
								23
								24
								25
3" SP	1.2	1.2	Good	KRF-A2-U105	1151	>1000		26
								27
								28
								29
								30
								31
								32
								33
								34
								35
								36
								37
								38
								39
								40

PROJECT RF Heating
JOB NO. 3688

BORING NO. A2

10'-12' Clay, dark brn, w/ minor gravel, FIL.

#2 liner - regular, #3 liner - duplicate

12'-14' Same as 10'-12'

#2 liner - regular

16'-18' Clay, silty, sandy, w/ minor gravel, dark brn, FIL, wet, #2 liner - regular

#3 liner - duplicate

20'-22.5' Same as 16'-18', sampled - #2 liner

21.5'-22' Gravel, silty, some clay, yellowish brn to tan, moist

26'-28.2' Gravel, silty, some clay, chert, yellowish brn to tan, moist

200 blows w/ 140 lb hammer for 1.2' down
#2 liner - regular

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	1.2	Good	KRF-EI-4118	0830			11
								12
								13
								14
								15
								16
3" SP	2.0	1.7	Good	KRF-EI-4118	0846	60		17
								18
								19
								20
								1
								2
								3
								4
3" SP	0.6	0.6	Fair	KRF-EI-42425	0934			5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT

RF Blotting

BORING NO.

JOB NO.

3688

E1

10'-12' clay, silty, w/ gravel,
dk br, moist.
#2 liner - regular

16'-18' gravel, clayey, yellowish
br to tan. Moist w/ fuel odor,
what appears to be free product?
#2 liner regular
#1 liner duplicate
#3 liner material had slipped out
partially therefore used #1 liner for dup

24'-24.6' gravel, silty, sl. clayey,
yellowish br to tan, dry

NOTES:



FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	THUSCAN (PPM)	LITHOLOGIC CORE	DEPTH (FEET)	PROJECT	BORING NO.
3" SP	2.0	1.3		KRF-E2-11012	1303	84		11	RF Heating	E2
								12		
								13		
								14		
								15		
								16		
								17		
								18		
								19		
								20		
								21		
								22		
								23		
								24		
								25		
								26		
3" SP	2.0	1.8		KRF-E2-11012	1337	220		27		
								28		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

NOTES:

10'-12' clay, sh. silty, w/ gravel, moist, med. brn to dk brn, FILL

#2 liner - regular

18' filler rejects gravel

26'-28' gravel, clayey

#2 liner - regular



FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	1.3	Good	KRF-E3-41416	1631	600		1
3" SP	2.0	1.8	Good	KRF-E3-41618	1644	38		2
3" SP	2.0	1.2	Good	KRF-E3-42022	1657	>1000		3
3" SP	0.9	0.9	Good	KRF-E3-42824	1734	480		4
								5
								6
								7
								8
								9
								10
								11
								12
								13
								14
								15
								16
								17
								18
								19
								20
								21
								22
								23
								24
								25
								26
								27
								28
								29
								30

PROJECT KRF Keating
JOB NO. 3688

BORING NO. E3

14'-16' Clay, sandy, silty, w/ gravel, moist, FILL

#2 liner - regular

16'-18' same as 14'-16' w/ wood fragments

#2 liner - regular

20'-22' Clay, sandy, w/ gravel med. brn to dk brn, moist, soft, solvent odor, FILL

#2 liner - regular

24' Gravel

28-29' Gravel

200 blows for 0.9' drive
#1 liner - regular

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	1.8	Good	KRF-E4-1104	1104	34		1
								2
								3
								4
								5
								6
								7
								8
								9
								20
								1
								2
								3
3" SP	2.0	1.6	Good	KRF-E4-1130	1130	600		24
								5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT RF Heating

BORING NO.

JOB NO. 3688

E4

9'-11' clay, sandy, silty, w/ gravel, dk br, moist at bottom, FILL

#2 liner - regular

24' Gravel

24'-26' Gravel, chunky, yellowish br, dry, solvent/fuel odor.

#2 liner - regular

NOTES:



FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
3" SP	2.0	2.0	Good	1418	240			11	AF Heating	E 5
3" SP	2.0	2.0	Good	1426	24			12		
								13		
								14		
								15		
								16		
								17		
3" SP	2.0	1.6	Good	1441	160			18		
								19		
								20		
3" SP	2.0	1.8	Good	1454	80			21		
								22		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

NOTES:

10'-12' Clay, silty, some sand, w/
gravel, dk br, moist, FILL #2
12'-14' Same as 10'-12'
#2 liner - regular

18'-20' Clay, sandy, silty, w/gravel,
dk br, moist to wet in spots, some
odor, FILL
#2 liner - regular

20'-22' Clay, sandy, silty, w/gravel
dk br, moist to wet in spots,
some odor, FILL
#2 liner - regular

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HRUSCAN (PPM) ^{GRA}	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
								11	RF Heating	E6
								12		
								13		
								14		
								15		
3" SP	2.0	1.6	Good	KRF-E6-416180	1410	180		16		
				KRF-E6-41618				17		
								18		
								19		
								20		
3" SP	2.0	1.6	Good	KRF-E6-42022	1420	>1000		21		
								22		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

16'-18' clay, silty, w/ some gravel, wood frags., moist, fuel odor, moist, FILL
#2 liner - reg
#3 liner - dup.

20'-22' clay, silty, w/ some large 3" diam chert clasts, moist, fuel odor, FILL
#2 liner - regular

NOTES:



FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	TRUSCAN (PPM)	LYTHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
3" SP	2.0	2.0	Good	KRF-E7-0249	169	70		1	RF Heating	E7
								2		
								3		
								4	12'-14'	clay, silty, w/ med gravel, med br to dk brn, moist
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

NOTES:



FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	HYDRAULIC (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT RF <i>Resting</i>	BORING NO. <i>E8</i>
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								10		
								11		
								12		
								13		
								14		
								15		
								16		
								17		
								18		
								19		
								20		
								21		
								22		
								23		
								24		
								25		
								26		
								27		
								28		
								29		
								30		
								31		
								32		
								33		
								34		
								35		
								36		
								37		
								38		
								39		
								40		
								41		
								42		
								43		
								44		
								45		
								46		
								47		
								48		
								49		
								50		

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	HAUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" GP	2.0	0.8	Good	NAF-FI-11012	74	0829		11
								12
								13
								14
								15
								16
								17
								18
2" GP	2.0	1.9	Good	NAF-FI-11020		>1000PPM		19
								20
								21
								22
								23
								24
								25
								26
								27
								28
								29
								30

PROJECT RF Heating

BORING NO.

JOB NO. 3688

F1

10'-12' Clay, silty, sandy, w/minor gravel, db br, moist, soft, FILL

#1 liner - regular

18'-20' Gravel, clayey, db br, wet w/ free product ~19'-20', FILL?
Fuel oil from sample

#2 liner - regular

NOTES:



FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

PROJECT RF <i>Resting</i>										BORING NO.	
JOB NO. 3688										F2	
SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	DVA HNSCAN (PPM)	LITHOLOGIC CONE	DEPTH (FEET)			
								11			
								12			
								13			
3" GP	2.0	1.6	Good	KRF-F2-41416	1011	240		14			
								15			
								16			
								17			
								18			
								19			
								20			
								21			
								22			
								23			
								24			
								25			
3" GP	1.5	1.5	Good	KRF-F2-42628	8001	1038		26			
								27			
								28			
								9			
								0			
								1			
								2			
								3			
								4			
								5			
								6			
								7			
								8			
								9			
								0			

14'-16' Clay, slightly silty, w/ gravel, moist, dk. brown, slight fuel odor, soft, FILL
#2 liner - regular

24' Gravel

26'-27.5' Gravel, clayey, yellowish brown, moist, outside wet from above strong fuel / solvent odor
#2 liner - regular
210 blows for 1.5' driven

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANALYST	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	20	1.5	2000	KRP- F3-4107	80	128		11
								12
								13
								14
								15
								16
								17
								18
								19
								20
								21
								22
								3
								4
								5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT

BORING NO.

JOB NO. 3688

F3

10'-12' clay, slightly silty, w/ gravel
dk br, moist, FILL

#2 liner regular

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HAUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	0.6	Good	KAF-EIA-4102		0		11
				KAF-EIA-4102		0		12
				KAF-EIA-4102		0		13
				KAF-EIA-4102		0		14
				KAF-EIA-4102		0		15
	2.0	1.2	Good	KAF-EIA-4108		120		16
				KAF-EIA-4108		120		17
				KAF-EIA-4108		120		18
				KAF-EIA-4108		120		19
				KAF-EIA-4108		120		20
				KAF-EIA-4108		120		21
				KAF-EIA-4108		120		22
				KAF-EIA-4108		120		23
				KAF-EIA-4108		120		24
	0.9	0.7		KAF-EIA-4108		700		25
				KAF-EIA-4108		700		26
				KAF-EIA-4108		700		27
				KAF-EIA-4108		700		28
				KAF-EIA-4108		700		29
				KAF-EIA-4108		700		30
				KAF-EIA-4108		700		31
				KAF-EIA-4108		700		32
				KAF-EIA-4108		700		33
				KAF-EIA-4108		700		34
				KAF-EIA-4108		700		35
				KAF-EIA-4108		700		36
				KAF-EIA-4108		700		37
				KAF-EIA-4108		700		38
				KAF-EIA-4108		700		39
				KAF-EIA-4108		700		40

PROJECT: RF Heating
JOB NO. 3688

BORING NO.

EIA

10'-12'

Silt, clayey, w/ gravel, some asphalt sl. moist, light to red. brn #1 liner

16'-18'

Silt, clayey, w/ gravel, red. brn to dk. brn moist to wet in spots, solvent or #2 liner

Gravel at 18'

24'-24.7' Gravel, clayey, yellowish brn, moist, strong solvent odor #1 liner

NOTES:

 HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	OYA TRANSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.7	Good	KRF-A2A-112021	38	0735		11
	2.0	1.7	Good	KRF-A2A-112021	40	0748		12
								13
								14
								15
								16
	2.0	1.3	Good	KRF-A2A-112022	74	0803		17
								18
								19
								20
	2.0	1.7	Good	KRF-A2A-112022	180	0812		21
								22
								23
								24
								25
								26
	0.5	0.5	Good	KRF-A2A-112027	40	0841		27
								28
								29
								30
								31
								32
								33
								34
								35
								36
								37
								38
								39
								40

PROJECT: RF Heating
JOB NO. 3688

BORING NO.

A2A

10'-12'

Silt, sl. clayey, w/ gravel, light bn, very dry, powdery, #2 liner, sample slightly warm

12'-14' Silt, sl. clayey, w/ gravel, light bn, very dry, powdery, #2 liner

16'-18' Silt, clayey, w/ some sand, moist to wet at bottom, solvent odor, sample slightly warm, #2 liner, dk bn.

20'-22' Silt, clayey, sandy, w/ minor gravel, dk bn, moist, solvent odor, #2 liner

23.5' gravel - driller reports

26' - 200 blows for 0.5' driven

26'-27' Gravelly, clayey, yellowish bn, moist to wet, solvent odor, #1 liner

NOTES:

HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

										PROJECT	BORING NO.
										RF Heating	
										JOB NO. 3688	A1A
SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)			
								11			
								12			
								13			
								14			
								15			
								16			
	2.0	0.7	Good			40		17	16-18' silt, clayey, w/ gravel, med. brn to dk brn, moist, #1 line		
						1610		18			
	2.0	0.8	Good			90		19	18-20' silt, clayey, w/ gravel, med. to dk brn, moist, #1 line		
						1616		20			
								21			
								22			
								23			
								24			
								25			
	0.7	0.7	Good			480		26	200 blows for 0.7' driven		
						1647		27	Gravel, clayey, yellowish brn, wet, solvent odor, #1 line		
								28			
								29			
								30			
								31			
								32			
								33			
								34			
								35			
								36			
								37			
								38			
								39			
								40			

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	ANUSCARI (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT RF <i>Hending</i>	BORING NO.
								1	JOB NO. 3688	TD7 / TD8
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

18' - 25' Gravel, silty, clayey,
yellowish brown to tan

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CORE	DEPTH (FEET)
								11
								12
								13
								14
3" GP	2.0	0.7	POOR	KRF-TD6-41416				15
					1438	20		16
								17
								18
								19
								20
								21
								22
								23
								24
3" GP	0.5	0						25
	1.5	1.9	POOR	15H	180			26
				KRF-TD6-42527				27
								28
								29
								30
								31
								32
								33
								34
								35
								36
								37
								38
								39
								40

PROJECT RF Heating

BORING NO.

JOB NO. 3688

TD6

Clay, silty, sandy, w/ gravel, sh
br 2nd soil
#1 liner

200 blows for 0.5', no recovery
till in down to 25'
25-26.5' gravel, large
#2 liner - regular

NOTES:



HALLIBURTON NUS

SHEET 2 OF 2

BORING NO.

TD5

3" 0.8 0.8 *Good* MW-7D5-42427
1028 > 1000

#1 liner - regular
270 blows for 0.8' drive

HALLIBURTON NUS



FIELD LOG OF BORING

SHEET 1 OF 1

PLAN

PROJECT

BORING NO.

RF Hesting

TD4

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger 4 1/2" ID

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 15

TIME
STARTED

1345

DATE

11/13/94

TIME

COMPLETED

1425

DATE

11/13/94

GROUND-WATER CONDITION AT
COMPLETION OF DRILLING

Dry

BACKFILLED,
TIME

DATE

WEATHER CONDITIONS

Partly Cloudy, mid 60°F, NE wind

SURFACE
ELEVATION

COMMENTS

gravel at sfc.

Hand drilling at 6' and 8'

SAMPLER
TYPE
FEET
DRIVEN
FEET
RECOVERED
SAMPLE
CONDITION
FIELD LABORATORY
SAMPLE NUMBER
FIXED LABORATORY
SAMPLE NUMBER
HNU SCAN
(PPM)
LITHOLOGIC
CODE
DEPTH
(FEET)



FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

T03

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger 4"

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 26.0

TIME STARTED 0953

DATE 11/13/94

TIME COMPLETED 1135

DATE 11/13/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED.
TIME

DATE

WEATHER CONDITIONS

Partly Cloudy, mid 50's, mod. NE wind

SURFACE
ELEVATION

COMMENTS

0'-1' Gravel at sfc.

1'- Gray, silty; med. to dk. brown w/ gravel, moist; #1 fines - regular

2'-1' Gray, silty; med. to dk. brown, w/ gravel, moist

SAMPLER TYPE
FEET DRIVEN
FEET RECOVERED
SAMPLE CONDITION
FIELD LABORATORY SAMPLE NUMBER
FIXED LABORATORY SAMPLE NUMBER
HNS SCAN
HNS SCAN (ppm)
LITHOLOGIC CODE
DEPTH (FEET)

3"	SP	2.0	0.7	Good	KRF-T03-41406	42	260
1							
2							
3							
4							
5							
6							
7							
8							
9							

FIELD LOG OF BORING

SHEET 1 OF

PLAN

PROJECT

BORING NO.

RF Heating

TD1 / TD2

JOB NO. *3688*

LOGGED BY: *BDH*

PROJ. MGR. *CFB*

EDITED BY:

DRILLING COMPANY: *55T*

DRILL RIG TYPE: *Mobile B-53*

DRILLING METHOD: *Roller Stem Auger 4 1/4" ID*

DRILLERS NAME: *John Talbot*

TOTAL DEPTH (FT.) *26*

TIME STARTED *1435*

DATE *1/13/94*

TIME COMPLETED *1541*

DATE *1/13/94*

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Partly Cloudy, upper 60°F, mod. NE wind

SURFACE ELEVATION

COMMENTS

Gravel at sfc.

Clay, silt, w/ gravel, rubber, wire, wood, FILL, moist.

SAMPLER TYPE
FEET DRIVEN
FEET RECOVERED
SAMPLE CONDITION
FIELD LABORATORY SAMPLE NUMBER
FIXED LABORATORY SAMPLE NUMBER
HNU SCAN (PPM)
LITHOLOGIC CODE
DEPTH (FEET)



HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF *Heating*

F5

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: *Mobile B-53*

DRILLING METHOD: *Hollow Stem Auger 4 1/2" ID*

DRILLERS NAME: *John Talbot*

TOTAL DEPTH (FT.) 24.2

TIME STARTED 0810

DATE 1/17/94

TIME COMPLETED 0950

DATE 1/17/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Dry

BACKFILLED.
TIME

DATE

WEATHER CONDITIONS

Partly cloudy, mid 40°F, strong N wind

SURFACE ELEVATION

COMMENTS

Gravel at sfc.

SAMPLER
TYPE
FEET
DRIVEN
FEET
RECOVERED
SAMPLE
CONDITION
FIELD LABORATORY
SAMPLE NUMBER
FIXED LABORATORY
SAMPLE NUMBER
HNU SCAN
(PPM)
LITHOLOGIC
CODE
DEPTH
(FEET)

1
2
3
4
5
6
7
8
9



SHEET: 1 OF 2

PROJECT

BORING NO.

RF Heating

F4

JOB NO. 3688

LOGGED BY: BPH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: *Hollow Stem Auger*

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 29

TIME STARTED 1454

DATE : 1/14/94

TIME COMPLETED 1646

DATE 1/14/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED. TIME

DATE _____

WEATHER CONDITIONS

Fair, upper 50°F, SW wind moderate

**SURFACE
ELEVATION**

COMMENTS

0-0. Gravel

0. - 2' Gray, silty, w/ gravel,
asphalt frags.; med. lim to dk lim

slightly moist, FILL

#2 line - regular

270

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB SAMPLE NO.	FIXED LAB SAMPLE NO.	LABORATORY (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	1.2	Good	KRF-F4-41214	1516	38		11
								12
								13
								14
								15
3" SP	2.0	0.6	Fair	KRF-F4-41618	1528	44		16
								17
								18
								19
								20
								21
								22
								23
								24
								25
								26
								27
3" SP	1.2	1.2		KRF-F4-42822	1604	7000		28
								29
								30
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT

RF Nesting

BORING NO.

JOB NO. 3688

F4

12'-14'

Clay, sh. silty, w/ gravel, dk brown, moist, FILL, some wood fragments

16'-18'

#1 liner - regular

24' Gravel, clayey, yellowish brown

28'-29' Gravel, clayey, yellowish brown

230 blows for 1.2' drive

NOTES:



FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HAUSCAT (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
3" SP	2.0	0.8	Good	KRF-F5-01124	0822 22			11
3" SP	2.0	1.2	Good	KRF-F5-01128	0827 >1000			12
3" SP	2.0	1.5	Good	KRF-F5-01130	0850 550			13
3" SP	1.2	1.2	Good	KRF-F5-01132	0934 1120			14
								15
								16
								17
								18
								19
								20
								21
								22
								23
								24
								5
								6
								7
								8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT RF Heating

BORING NO.

JOB NO. 3688

F5

12-14' Clay, silty, w/ gravel, dk brn, moist, soft, FILL

#1 liner - regular

16-18' Clay, silty, w/ gravel, dk brn, moist, soft, slight fuel odor, FILL

#2 liner - regular

18-20' Clay, silty, sandy, w/ gravel, dk brn, moist, slight fuel odor, soft, FILL

22' Hit gravel 3" block of steel nail

22-24' Gravel, 200 blows for 0.3' driver, no recovery, will drill down to 23' and try again

23-24.2 Gravel, clayey, yellowish brn to tan, dry

200 blows for 1.2' driver

#2 liner - regular

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER
TYPE
FEET
DRIVEN
FEET
RECOVERED
SAMPLE
CONDITION
FIELD LAB
SAMPLE NO.
FIXED LAB
SAMPLE NO.
HNUSCAT
(PPM)
LITHOLOGIC
CODE
DEPTH
(FEET)

PROJECT

RF Hasting

BORING NO.

JOB NO. 3688

TD1 / TD2

1
2
3
4
5
6
7
8
9
10
1
2
3
4
5
6
7
8
9
0
1
2
3
4
5
6
7
8
9
0

24' Gravel

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER
TYPE
FEET
DRIVEN
FEET
RECOVERED
SAMPLE
CONDITION
FIELD LAB
SAMPLE NO
FIXED LAB
SAMPLE NO
HANDS ON
DVA
PPM
LITHOLOGIC
CODE
DEPTH
(FEET)

PROJECT
RF Heating
JOB NO. 3688

BORING NO.
TD3

3"
SP 2.0 1.8

RF-703-41416
1024 50

3"
SP 2.0 1.8

RF-703-42426
1049 >1000

14'-16' Clay, silty, w/gravel, wood,
lign, under frag., med. br to
dk br, moist, FILL
#2 liner - regular

24'-26' Gravel, clayey, yellowish
tan, wet

#2 liner - regular
#3 liner - duplicate

NOTES:



SHEET: 1 OF 2

BORING NO.

TD5

LOGGED BY: BDH

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger 4 1/2"

DRILLERS NAME: *Wm Talbot*

TOTAL DEPTH (FT.) 24.8

TIME STARTED 0941

DATE 1/19/94

TIME COMPLETED 1058

DATE 1/19/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Net

BACKFILLED, TIME

DATE _____

WEATHER CONDITIONS

Partly Cloudy, to 30°F, NE wind

**SURFACE
ELEVATION**

COMMENTS

SAMPLER	
TYPE	
FEET	
DRIVEN	
FEET	
RECOVERED	
SAMPLE	
CONDITION	
FIELD LABORATORY	
SAMPLE NUMBER	
FIXED LABORATORY	
SAMPLE NUMBER	
HAZ SCAN	07A
(PPM)	
LITHOLOGIC	
CODE	
DEPTH	
(FEET)	

3"
SP

2.0, 1.0 Fair

RAF-705-40400
2946 2

4-10 clay, silt, dk brown, w/
gravel, slightly moist

1. inner - pulse



SHEET 1 OF 2

BORING NO.

TD6

LOGGED BY: BRH

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile A-53

DRILLING METHOD: Hollow Stem Auger 4 1/4"

DRILLERS NAME: John Talbot

TOTAL DEPTH (FT.) 26.5

TIME STARTED 1418

DATE 1/18/44

TIME COMPLETED 1543

DATE 1/18/94

GROUND-WATER CONDITION AT
COMPLETION OF DRILLING

BACKFILLED.	DATE
TIME	

WEATHER CONDITIONS

Partly Cloudy, mid 40°F, strong NE in gusty

SURFACE ELEVATION		COMMENTS
1	2	

SAMPLER
TYPE
FEET
DRIVEN
FEET
RECOVERED
SAMPLE
CONDITION
FIELD LABORATORY
SAMPLE NUMBER
FIXED LABORATORY
SAMPLE NUMBER
RNI SCAN
(PPM) *07A*
LITHOLOGIC
CODE
DEPTH
(FEET)

139

2.0 1.0 Fair

KRF-706-110406

#1 line - regular



HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

TD7 / TD8

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: SST

DRILL RIG TYPE: Mobile B-53

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: John Fabbot

TOTAL DEPTH (FT.) 25

TIME STARTED 1410

DATE 1/12/94

TIME COMPLETED 1610

DATE 1/12/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME

DATE

WEATHER CONDITIONS

Overcast, upper 50's F, strong NE wind

SURFACE ELEVATION

COMMENTS

0'-0.5' Gravel

0.5' - 18' Till, clay, silty, w/ gravel med. br to dk br, moist

SAMPLER TYPE
FEET DRIVEN
FEET RECOVERED
SAMPLE CONDITION
FIELD LABORATORY SAMPLE NUMBER
FIXED LABORATORY SAMPLE NUMBER
INITIAL SCAN (PPM)
LITHOLOGIC CODE
DEPTH (FEET)

FIELD LOG OF BORING

 SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

A1A

JOB NO. 36880

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: Jodi

DRILL RIG TYPE: Mobile 8-61

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: Kana

TOTAL DEPTH (FT.) 27

TIME STARTED 1526

DATE 7/11/94

TIME COMPLETED 1716

DATE 7/11/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME 1720

DATE 7/11/94

WEATHER CONDITIONS

Fair, hot, mid 90°F, light SE wind

SURFACE ELEVATION

COMMENTS

Silt, clayey, w/ some gravel, light to med. brn

Very dry

#2 liner

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	RND SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
--------------	-------------	----------------	------------------	--------------------------------	--------------------------------	----------------	-----------------	--------------

2.0 1.7 Good

22

@1543

1

2

3

4

5

6

7

8

9



HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT <i>RF Heating</i>	BORING NO. <i>A2A</i>
JOB NO. <i>36880</i>	LOGGED BY: <i>BDH</i>
PROJ. MGR. <i>CFB</i>	EDITED BY:
DRILLING COMPANY: <i>Jdi</i>	
DRILL RIG TYPE: <i>Mobile B-61</i>	
DRILLING METHOD: <i>Hollow Stem Auger</i>	
DRILLERS NAME: <i>Ramon</i>	
TOTAL DEPTH (FT.) <i>27</i>	
TIME STARTED <i>0655</i>	DATE <i>7/13/94</i>
TIME COMPLETED <i>0916</i>	DATE <i>7/13/94</i>

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.1	Good		<i>NRF-A2A-40002</i>	34		1
						<i>@ 5706</i>		2
	2.0	0.7	Good		<i>NRF-A2A-40004</i>	12		3
						<i>@ 0712</i>		4
	2.0	1.2	Good		<i>NRF-A2A-40006</i>	<i>@ 0725</i>		5
						300		6
								7
								8
								9
								10

GROUND-WATER CONDITION AT COMPLETION OF DRILLING <i>~ 25'</i>
BACKFILLED, TIME <i>0926</i> DATE <i>7/13/94</i>
WEATHER CONDITIONS <i>Partly Cloudy, mid 70°F, SE wind</i>
SURFACE ELEVATION
COMMENTS <i>0.0' - 0.3' Sand gravel</i>
<i>0.3' - 2.0' silt, clayey, w/ gravel, brick fragments in soil, med. bn, dry to very sl moist at bottom, #1 liner</i>
<i>Silt, clayey, w/ gravel, med bn, sl. moist, #1 liner</i>
<i>4'-6' 1st run recovered 0.3' not enough to sample, pushed spoon again</i>
<i>Silt, sl. clayey, w/ gravel, brick fragments, very dried out, grayish, sample slightly warm, #1 liner, yellowish bn to light bn.</i>



SHEET 1 OF 2

BORING NO.

EIA

LOGGED BY: BDH

EDITED BY:

DRILLERS NAME: *Roman*

DATE 7/9/94

DATE 7/9/94

moist @ 25'

DATE 7/9/94

WEATHER CONDITIONS

Partly Cloudy, mid 70°F, little wind

**SURFACE
ELEVATION**

COMMENTS

0.0' - 0.2' Orange br sd (fill), gravel
at sp. fill.

0.2' - 2.0' silt, clayey, w/ gravel,
red. to dk brn; st. moist
#2 line

280



HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT <i>RF Heating</i>	BORING NO. <i>E2A</i>
JOB NO. <i>3688</i>	LOGGED BY: <i>BDH</i>
PROJ. MGR. <i>CFB</i>	EDITED BY:
DRILLING COMPANY: <i>22di</i>	
DRILL RIG TYPE: <i>Mobile B-61</i>	
DRILLING METHOD: <i>Hollow Stem Auger</i>	
DRILLERS NAME: <i>Ramon</i>	
TOTAL DEPTH (FT.) <i>26.6</i>	
TIME STARTED <i>0917</i>	DATE <i>7/9/94</i>
TIME COMPLETED <i>1025</i>	DATE <i>7/9/94</i>

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	RFN SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	<i>2.0</i>	<i>1.2</i>	<i>Good</i>		<i>1RF-E2A-4002</i>	<i>2</i>		<i>1</i>
					<i>0916</i>			<i>2</i>
								<i>3</i>
								<i>4</i>
								<i>5</i>
								<i>6</i>
								<i>7</i>
								<i>8</i>
								<i>9</i>
								<i>10</i>

GROUND-WATER CONDITION AT COMPLETION OF DRILLING <i>~ 25'</i>	
BACKFILLED, TIME <i>1041</i>	DATE <i>7/9/94</i>

WEATHER CONDITIONS
Partly Cloudy, hot, upper 80°F, light SE wind

SURFACE ELEVATION

COMMENTS

0.0' - 0.2' orange brn sand (fill) and gravel, dry

2.2' - 2.0' silty, clayey, w/ gravel, med. brn

1 liner

APPENDIX L

PERMEABILITY CALCULATIONS

Radio Frequency Heating Decontamination Demonstration
Site S-1, Kelly AFB

Contract No. F33615-90-D-4011
Delivery Order No. 0007

Calculations Prepared By:

Laura H. Whitt

Date:

12/27/94

Calculations Checked By:

Date:

PURPOSE:

Estimate the vapor permeability of the soil at Site S-1 at several times during the demonstration of KAI's heating method.

REFERENCES:

Johnson, P., M. Kemblowski, and J. Cohart. Quantitative Analysis for the Cleanup of Hydrocarbon-Contaminated Soils by In-Situ Soil Venting. GROUNDWATER. 1990 May-June;28(3): 413-429.

Operating Conditions Logbook. (Data collected by Brown & Root Environmental personnel during the demonstration.)

Radian Corporation. Final Report [Vapor Stream Analysis]: Superfund Innovative Technology Evaluation: KAI Technologies, Inc.: Radio Frequency Heating Demonstration. Sept. 7, 1994.

Shames, Irving. Mechanics of Fluids. New York: McGraw Hill Book Company, 1982.

Subsurface pressure contours hand drawn onto Site Layout Map (Brown & Root Environmental Drawing # 3688G016.

Surface Weather Observation forms for Kelly AFB from the National Climatic Data Center (NCDC)

ASSUMPTIONS:

The viscosity of the vapor stream is estimated as the viscosity of air at the vapor stream temperature.

The flow rates measured by Radian Corporation during vapor sampling events are considered to be more accurate than the flow rates measured daily by Brown & Root Environmental.

The radius of influence (R_i) is defined as the distance from the extraction wells to the 0.5" H_2O subsurface pressure contour. R_i for these calculations was estimated based on the contours in the heated area.

Screened length for all extraction wells is 9 feet.

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HRUSCAN (PPM) %	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
	2.0	1.1	Good	KRF-TD6A-41416		54		5
						0914		6
								7
								8
								9
								10
								11
								12
								13
								14
								15
								16
								17
								18
								19
								20
								21
								22
								23
								24
								25
								26
	1.0	0.9	Good	KRF-TD6A-42627		250		27
						0454		28
								29
								30
								31
								32
								33
								34
								35
								36
								37
								38
								39
								40

PROJECT RF Heating
JOB NO. 3688

BORING NO. TD6A

(clay, silty, w/ some gravel, sl. moist, med. to dk brn, #1 liner)

Gravel at 19'

Water at ~25'

150 blows for 1' driven

Gravel, clayey, yellowish brn, tan, wet, solvent smell

#1 liner

NOTES:

 **HALLIBURTON NUS**
Engineering Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HYDROSCAN (PPM) %	LITHOLOGIC CODE	DEPTH (FEET)
								11
								12
								13
								14
	2.0	1.1	Good		KRF-TD5A-11416	71000		15
								16
								17
					@ KRF-TD5A-0710			18
								19
								20
								21
								22
								23
								24
	0.9	0.9	Good		KRF-TD5A-02425	300		25
								26
								7
					KRF-0745			8
								9
								0
								1
								2
								3
								4
								5
								6
								7
								8
								9
								0

PROJECT *RF Heating*
JOB NO. *3688*

BORING NO. *TD5A*

Silt, clayey, w/ some gravel, med. to dk. brn, sh. moist.

#1 liner

Gravel at 18.5'

100 blows for 0.9' driven

gravel, clayey, yellowish brn, wet in spots, solvent odor

#1 liner

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
								1	AF Relating	TD3A
								2		
								3		
	2.0	0.8	Good		38			4		
				KRF - TD3A-41416	@1502			5		
								6		
								7		
								8		
								9		
								20		
								21		
								22		
								23		
	1.0	0.5	Fair		120			24		
				KRF - TD3A-42425	@1533			25		
								26		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

Libr, clayey, w/ some gravel, med to dk brn, moist
#1 liner

Gravel at ~18.5'

24'-25' Gravel, clayey, yellowish brn, wet, solvent odor
#1 liner

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HAUSCAN (PPM) ^{GRAV}	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
								11	HF Heating	F5A
	2.0	0.2	Good			0		12		
								13		
								14		
								15		
	2.0	1.1	Good			198		16		
								17		
	2.0	1.4	Good			500		18		
								19		
								20		
								21		
	1.2	1.1	Good			380		22		
								23		
								24		
								25		
								26		
								27		
								28		
								29		
								30		
								31		
								32		
								33		
								34		
								35		
								36		
								37		
								38		
								39		
								40		

12'-14' Silt, clayey, w/ gravel, light br, very dry, powdery texture, more moist at bottom, hard.

16'-18' Silt, clayey, w/ gravel, med. br to dk br, moist, #2 liner

18'-20' Silt, clayey, w/ gravel, med. to dk br, moist, wet in spots at bottom, slight odor, #2 liner
Driller reports gravel at 21.5'

22'-23.2' Gravel, silty, clayey, yellowish br, moist, slight odor #2 liner
200 blows for 12' driven

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HVS SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
									RF Heating	F4A
	2.0	1.5	Good					11		
								12		
	2.0	1.5	Good					13		
								14		
								15		
								16		
	2.0	1.2	Good					17		
								18		
								19		
								20		
								21		
								22		
								23		
								24		
								25		
								26		
								27		
								28		
	1.0	1.0	Good					29		
								30		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

12'-14' Silt, clayey, w/ some gravel, med. to dk brn, moist

#1 liner - duplicate

#2 liner - regular

16'-18' Silt, clayey, w/ some gravel, med. to dk brn, moist, solvent odor

#2 liner

Differ reports gravel at 21'

28'-29'

200 blows for 1.0' driven

Gravel, silty, yellowish brn, wet, solvent odor, #1 liner

NOTES:

 **HALLIBURTON NUS**
Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HNUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
									AF <i>Heating</i>	F 3 A
	2.0	0.8	Fin			100		11		
						1034		12		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

10'-12'
Silt, slightly clayey, w/gravel, light
tan, very dry, sandy.
#1 lens

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HUSCAN 03 (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
									RF Heating	F2A
								11		
								12		
								13		
	2.0	0.7	Good		F2A-111416			14		
								15		
								16		
								17		
								18		
								19		
								20		
								21		
								22		
								23		
								24		
								25		
								26		
	1.0	1.4	Good					27		
								28		
								29		
								30		
								31		
								32		
								33		
								34		
								35		
								36		
								37		
								38		
								39		
								40		

14-16' Silty, clayey, w/ some gravel, light br, dried out portion, med. to dark br, sl. moist portion. Top part of sample is very dried out, powdery appearance; lower half is sl. moist and very hard, more cohesive #1 liner (chunk of hard soil in shoe (catcher) blocked better sample recovery Driller reports gravel at 17.5' bottom bit is wet when pulled at 26'

26-27' 150 blows for 1.0' driven Gravel, clayey, yellowish br, wet, strong silty odor #1 liner - duplicate #2 liner - regular

NOTES:

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HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANALYST	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
	2.0	0.6	Fair		KRF-FIA-41820	6		11	AF Testing	FIA
					KRF-FIA-41820			12		
								13		
								14		
								15		
								16		
								17		
	2.0	1.5	Good		KRF-FIA-41820	460		18		
					KRF-FIA-41820			19		
								20		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

10-12'

Silt, clayey, w/ gravel, light
 brown, extremely dry, powdery,
 #1 liner

(clay), silty, w/ gravel, dk brown, moist
 solvent odor

#1 liner duplicate
 #2 liner regular

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	HUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
									RF Heating	E8A
									JOB NO. 3688	
								11		
								12		
								13		
								14		
								15		
								16		
								17		
								18		
								19		
								20		
								21		
								22		
								23		
								24		
	1.0	0.9	Good			1358		25	100 blows for 1 driven in gravel	
	1.0	0.8	Good			1430		26	knovel, silty, clayey, yellowish br.	
	↓	↓	↓			1500		26-27	wet, strong solvent odor, #1 liner	
								27		
								28		
								29		
								30	wet	
								31		
								32	#1 liner	
								33		
								34		
								35		
								36		
								37		
								38		
								39		
								40		

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANALYST	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
								11	RF Nesting	E7A
	2.0	1.4	Good		1050			12		
				HRF-E7A-41214	62			13		
								14		
								5		
								6		
								7		
								8		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

Notes on log:
 Clay, silty, w/ some gravel, med. to dk br
 #2 liner
 #1 liner - particle analysis
 #3 liner - particle analysis duplicate

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	THUSCAN ^{OVA} (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
									RF <i>Keating</i>	E6A
									JOB NO. 3688	
								1		
								2		
								3		
								4		
								5		
								6		
	2.0	1.2	Good		KRF-E6A-4/6/8	60		7		
								8		
								9		
								10		
	2.0	0.4	Good		KRF-E6A-4/6/8	54		11		
								12		
	1.0	0.2	Good					13		
								14		
								15		
								16		
								17		
								18		
								19		
								20		
								21		
								22		
								23		
								24		
								25		
								26		
								27		
								28		
								29		
								30		
								31		
								32		
								33		
								34		
								35		
								36		
								37		
								38		
								39		
								40		

Silt, clayey, w/ gravel, med. to
dk. br, sl. moist, up to 60 ppm
max., ~20 ppm sustained.
#1 liner, #2 liner for particle size
Silt, clayey, w/ gravel, med. to
dk. br, moist, solvent odor
#1 liner

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	AVA SAMPLE NO.	HUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
	2.0	1.4	Good	NAF-E5A-4124	140		140		11
	2.0	0.7	Good	NAF-E5A-4124	0		0		12
				NAF-E5A-4124	1320		1320		13
				NAF-E5A-4124					14
				NAF-E5A-4124					15
				NAF-E5A-4124					16
				NAF-E5A-4124					17
	2.0	1.6	Good	NAF-E5A-4124	240		240		18
				NAF-E5A-4124	1331		1331		19
				NAF-E5A-4124					20
	2.0	1.5	Good	NAF-E5A-4124	>1000		>1000		21
				NAF-E5A-4124	1342		1342		22
				NAF-E5A-4124					23
				NAF-E5A-4124					24
				NAF-E5A-4124					25
				NAF-E5A-4124					26
				NAF-E5A-4124					27
				NAF-E5A-4124					28
				NAF-E5A-4124					29
				NAF-E5A-4124					30

PROJECT RF Hesting

BORING NO.

JOB NO. 3688

E5A

10'-12'

Silt, clayey, m! gravel, light
br, very dry, powdery, #2 liner
12-14' Silt, clayey, minor gravel, very
dry, powdery
#1 liner

18'-20' Silt, clayey, minor gravel, sand
med. to dk br, moist
#2 liner

20'-22' Silt, clayey, sandy, minor
gravel, dk br, moist
#2 liner

NOTES:

SHEET 2 OF 2

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANUSCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
									AF <i>Wasting</i>	E3A
								11		
								12		
								13		
								14		
	2.0	1.6	Good	KRF-E3A-U1416	E3A-U1416D	8		15		
								16		
	2.0	1.6	Good	KRF-E3A-U1416	E3A-U1416D	1142		17		
						220		18		
								19		
	2.0	1.7	Good	KRF-E3A-U1416	E3A-U1416D	260		20		
						1150		21		
								22		
								23		
								24		
								25		
								26		
								27		
	0.7	0.7	Good	KRF-E3A-U1416	E3A-U1416D	140		28		
						1239		29		
								30		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								10		

14'-16' Silt, clay, some gravel, med. to dk brn, sl. moist
#1 liner - duplicate
#2 liner - regular
16'-18' Silt, clay, sandy, w/ some gravel, med brn to dk brn, moist strong solvent odor
#1 liner duplicate
#2 liner regular
19' Gravel
20'-22' Clay, sandy, silty, minor gravel, med. to dk brn, moist, strong solvent odor
#2 liner - regular
28'-29.7' Gravel, clayey, yellowish brn wet, strong solvent odor, #1 liner

NOTES:

FIELD LOG OF BORING (CONT'D.)

SHEET 2 OF 2

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LAB. SAMPLE NO.	FIXED LAB. SAMPLE NO.	ANALYST (PPM)	LITHOLOGIC CODE	DEPTH (FEET)	PROJECT	BORING NO.
	2.0	1.1	Good			5		11	RF Heating	E2A
								12		
								13		
								14		
								15		
								16		
								17		
								18		
								19		
								20		
								21		
								22		
								23		
								24		
								25		
								26		
	2.0	0.6	Fair			260		27		
								28		
								9		
								0		
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
								0		

10'-12' silt, clay, w/ gravel, med.
to dk br, red. moist
#1 liner

Gravel at 25'

26' - 26.6' Gravel, clayey, yellowish
brown, wet at lower 0.2'; strong shear
#1 liner

NOTES:

FIELD LOG OF BORING

 SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

E3A

JOB NO. 36880

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: Jodi

DRILL RIG TYPE: Mobile B-61

DRILLING METHOD: Hollow stem auger

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 28.7

TIME STARTED 1058

DATE 7/8/94

TIME COMPLETED 1337

DATE 7/8/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

~25'

BACKFILLED, TIME 1354

DATE 7/8/94

WEATHER CONDITIONS

Partly cloudy - to 90°F, SE wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	RNU SCAN (PPM) OVA	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9
								10



HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

EYA

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: JEDI

DRILL RIG TYPE: Mobile B-61

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 26

TIME STARTED 0732

DATE 7/12/94

TIME COMPLETED 0923

DATE 7/12/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

~25'

BACKFILLED, TIME 0940

DATE 7/12/94

WEATHER CONDITIONS

Partly cloudy, mid 70°F, SE wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	THU SCAN (PPM)	OYA	LITHOLOGIC CODE	DEPTH (FEET)
									1
									2
									3
									4
									5
									6
	2.0	0.8	Good						7
									8
									9
	2.0	0.7	Fair						10

11RF-05E-110608
11RF-EYA-40609
@0757

11RF-EYA-40611
22
@0824

6'-8'

Silt, clayey, w/ gravel, dried out to sl. moist, red. br.

Took 5'-10' sample, but driller dropped it into boom bucket, will resample @ 9'-11'

9'-11' Silt, clayey, w/ gravel, and

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

E5A

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: Jodi

DRILL RIG TYPE: Mobile B-61

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 22

TIME STARTED 1228

DATE 7/12/94

TIME COMPLETED 1357

DATE 7/12/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

BACKFILLED, TIME 1357

DATE 7/12/94

WEATHER CONDITIONS

Partly Cloudy, to 90°F, strong SE wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN OVA (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
	0.6	0.6			KRF-E5A-40406	10		5
	2.0	0.9	Good			@1244		6
								7
	2.0	1.6	Good			140		8
						@1253		9
								10

4'-6' 1st run recovered 0.6', recovered concrete ~ 4" in spoon, rest back in being to get 4'-6' interval
Silt, clayey, w/ gravel, #1 liner

6'-8' Silt, clayey, w/ gravel, light iron, very dried out, powdery
#2 liner

FIELD LOG OF BORING

 SHEET 1 OF 2

PLAN

PROJECT <i>RF Heating</i>	BORING NO. <i>E6A</i>
JOB NO. <i>3688</i>	LOGGED BY: <i>BDH</i>
PROJ. MGR. <i>CFB</i>	EDITED BY:
DRILLING COMPANY: <i>Jedi</i>	
DRILL RIG TYPE: <i>Mobile B-61</i>	
DRILLING METHOD: <i>Hollow Stem Auger</i>	
DRILLERS NAME: <i>Ramon</i>	
TOTAL DEPTH (FT.) <i>23</i>	

TIME STARTED <i>0737</i>	DATE <i>7/7/94</i>
TIME COMPLETED <i>0940</i>	DATE <i>7/7/94</i>

 GROUND-WATER CONDITION AT COMPLETION OF DRILLING
Dry

BACKFILLED, TIME <i>0948</i>	DATE <i>7/7/94</i>
------------------------------	--------------------

 WEATHER CONDITIONS
Partly Cloudy, mid 70°F, SE wind, mod

 SURFACE ELEVATION
 COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HHH SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9
								10

SP 2.0 0.4 Good

ART-E6A-40810

12

0800

302

Silt, clayey w/ some gravel, med. to dk brown, sh. moist #1 liner, #2 liner for particle analysis



FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT <i>RF Heating</i>	BORING NO. <i>E7A</i>
JOB NO. <i>3688</i>	LOGGED BY: <i>BDH</i>
PROJ. MGR. <i>CFB</i>	EDITED BY:
DRILLING COMPANY: <i>Jedi</i>	
DRILL RIG TYPE: <i>Mobile B-61</i>	
DRILLING METHOD: <i>Hollow Stem Augers</i>	
DRILLERS NAME: <i>Ramon</i>	
TOTAL DEPTH (FT.) <i>14</i>	
TIME STARTED <i>1000</i>	DATE <i>7/7/94</i>
TIME COMPLETED <i>1102</i>	DATE <i>7/7/94</i>

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HAND SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
					<i>KRF-E7A-40204</i>	<i>0.4</i>		1
								2
	<i>2.0</i>	<i>1.7</i>	<i>Good</i>			<i>3</i>		3
								4
								5
								6
								7
								8
								9
								10

GROUND-WATER CONDITION AT COMPLETION OF DRILLING <i>Dry</i>	
BACKFILLED, TIME <i>1114</i>	DATE <i>7/7/94</i>
WEATHER CONDITIONS <i>Partly Cloudy, upper 80°F, SE wind</i>	
SURFACE ELEVATION	
COMMENTS	

Silt, clayey, w/ some gravel up to 3" diam., med br.
#2 liner
#1 line duplicate
#3 line particle analysis

FIELD LOG OF BORING

 SHEET 1 OF 2

PLAN

PROJECT <i>RF Nesting</i>	BORING NO. <i>E8A</i>
JOB NO. <i>3688</i>	LOGGED BY: <i>BDH</i>
PROJ. MGR. <i>CFB</i>	EDITED BY:
DRILLING COMPANY: <i>Jedi</i>	
DRILL RIG TYPE: <i>Mobile B-61</i>	
DRILLING METHOD: <i>Hollow Stem Auger</i>	
DRILLERS NAME: <i>Ramon</i>	
TOTAL DEPTH (FT.) <i>27</i>	
TIME STARTED <i>1055</i>	DATE <i>7/7/94</i>
TIME COMPLETED <i>1450</i>	DATE <i>7/7/94</i>

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
	2.0	1.3	Good					7
								8
								9
								10

GROUND-WATER CONDITION AT COMPLETION OF DRILLING <i>~ 25'</i>	
BACKFILLED, TIME <i>1506</i>	DATE <i>7/7/94</i>
WEATHER CONDITIONS <i>Partly Cloudy, mid 90°F, SE wind, gusty</i>	
SURFACE ELEVATION	
COMMENTS	

Silt, lumpy, some gravel, light to med brown, very dry

#2 liner

#1 liner particle analysis



HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

FIA

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: Jedi

DRILL RIG TYPE: Mobile B-61

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 20

TIME STARTED 1058

DATE 7/9/94

TIME COMPLETED 1200

DATE 7/9/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

Dry

BACKFILLED, TIME 1209

DATE 7/9/94

WEATHER CONDITIONS

Partly Cloudy, hot, approx 90°F, slight SE wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9
								10

2.0 0.6 Jan

KRF- FIA-40406

@ 1111

Silt, clay, w/ gravel, concrete, asphalt-like material, med. to dk brn, concrete at end of shoe blocking it.

#1 line



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Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

Blank area for PLAN drawing.

PROJECT <i>RF Heating</i>	BORING NO. <i>F2A</i>
JOB NO. <i>3688</i>	LOGGED BY: <i>BDH</i>
PROJ. MGR. <i>CFB</i>	EDITED BY:
DRILLING COMPANY: <i>bdh</i>	
DRILL RIG TYPE: <i>Mobile B-61</i>	
DRILLING METHOD: <i>Hollow stem auger</i>	
DRILLERS NAME: <i>Ramon</i>	
TOTAL DEPTH (FT.) <i>27.4</i>	
TIME STARTED <i>0738</i>	DATE <i>7/11/94</i>
TIME COMPLETED <i>0915</i>	DATE <i>7/11/94</i>

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU \$CAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
								5
								6
								7
								8
								9
								10

GROUND-WATER CONDITION AT COMPLETION OF DRILLING
~ 25'

BACKFILLED, TIME *0920* DATE *7/11/94*

WEATHER CONDITIONS
Partly cloudy, mid 70°F, light SE wind

SURFACE ELEVATION

COMMENTS

Blank area for comments.



SHEET 1 OF 2

BORING NO.

F3A

LOGGED BY: CFB

EDITED BY:

DRILLERS NAME: Ramon

DATE 7/12/94

DATE 7/12/94

Bray

DATE 7/12/94

WEATHER CONDITIONS

**SURFACE
ELEVATION**

COMMENTS

307

FIELD LOG OF BORING

 SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

 RF *Heating*

F4A

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

 DRILLING COMPANY: *Idri*

 DRILL RIG TYPE: *Mobile 8-61*

 DRILLING METHOD: *Hollow Stem Auger*

 DRILLERS NAME: *Ramon*

TOTAL DEPTH (FT.) 29

TIME STARTED 1248

DATE 7/11/94

TIME COMPLETED 1450

DATE 7/11/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

~25'

BACKFILLED, TIME 1500

DATE 7/11/94

WEATHER CONDITIONS

Fair, hot, lo 90°F, light SE wind

SURFACE ELEVATION

COMMENTS

*Silt, clayey, w/ gravel, red
 lo to dk lo, dry to sl
 moist, w/ brick fragments,
 #2 liner*

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
--------------	-------------	----------------	------------------	--------------------------------	--------------------------------	----------------	-----------------	--------------

2.0

1.2

Good

KRF-F4A-110002

6

@1305

1

2

3

4

5

6

7

8

9

10 808



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Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

RF *Heating*

BORING NO.

F5A

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: *Jedi*

DRILL RIG TYPE: *mobile B-61*

DRILLING METHOD: *Hollow Stem Auger*

DRILLERS NAME: *Ramon*

TOTAL DEPTH (FT.) 23.2

TIME STARTED 0942

DATE 7/11/94

TIME COMPLETED 1123

DATE 7/11/94

GROUND-WATER CONDITION AT
COMPLETION OF DRILLING

BACKFILLED,
TIME 1129

DATE 7/11/94

WEATHER CONDITIONS

Partly Cloudy, mid 80°F, light SE wind

SURFACE
ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
-----------------	----------------	-------------------	---------------------	-----------------------------------	-----------------------------------	-------------------	--------------------	-----------------

1

2

3

4

5

6

7

8

9

10

309

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

BORING NO.

RF Heating

TD3A

JOB NO. 36880

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: Jdi

DRILL RIG TYPE: Mobile B-61

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 25

TIME STARTED 1420

DATE 7/8/94

TIME COMPLETED 1554

DATE 7/8/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

~25'

BACKFILLED, TIME 1604

DATE 7/8/94

WEATHER CONDITIONS

Partly Cloudy, upper 90°F, moderate SE. z

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HHV SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
4.5	2.0	0.2	Poor			28		5
5-7								6
	2.0	0.2				6		7
6.5-8.5	2.0	0.6	Poor			1450		8
								9
								10

4.0'-4.2' Silt, clayey w/ gravel, piece of concrete at end of samples blocking sample recovery

Concrete still preventing good recovery, will go down 1' and try again.

6.5'-8.5' Silt, clayey, w/ gravel, med. to dk br; sl. moist #1 liner



SHEET 1 OF 2

| BORING NO.

T05A

LOGGED BY: BDH

EDITED BY:

DRILLERS NAME: *Ramona*

DATE 7/8/94

DATE 7/8/94

By

DATE 7/8/94

Partly Cloudy
SURFACE

**SURFACE
ELEVATION**

COMMENTS

DEPTH
(FEET)

Good

KRF - 705A-40406

4

0674

1/

2

3

14

5

46

47

8

49

1, 2,



HALLIBURTON NUS
Environmental Corporation

FIELD LOG OF BORING

SHEET 1 OF 2

PLAN

PROJECT

RF Heating

BORING NO.

TD6A

JOB NO. 3688

LOGGED BY: BDH

PROJ. MGR. CFB

EDITED BY:

DRILLING COMPANY: Jedi

DRILL RIG TYPE: Mobile B-61

DRILLING METHOD: Hollow Stem Auger

DRILLERS NAME: Ramon

TOTAL DEPTH (FT.) 27

TIME STARTED 0846

DATE 7/8/94

TIME COMPLETED 1012

DATE 7/8/94

GROUND-WATER CONDITION AT COMPLETION OF DRILLING

25'

BACKFILLED, TIME 1030

DATE 7/8/94

WEATHER CONDITIONS

Partly Cloudy, to 80°F, SE wind

SURFACE ELEVATION

COMMENTS

SAMPLER TYPE	FEET DRIVEN	FEET RECOVERED	SAMPLE CONDITION	FIELD LABORATORY SAMPLE NUMBER	FIXED LABORATORY SAMPLE NUMBER	HNU SCAN (PPM)	LITHOLOGIC CODE	DEPTH (FEET)
								1
								2
								3
								4
	2.0	0.9	Good		RF TD6A-40406	3		5
								6
								7
								8
								9
								10

PERMEABILITY CALCULATIONS

CALCULATIONS:

APPENDIX L

Equation used for calculations (from Reference 1):

$$k = \frac{Q \mu [\ln (R_w / R_i)]}{H \pi P_w [1 - (P_{ATM} / P_w)^2]}$$

where:

- k = vapor permeability
- Q = vapor flow rate (ASCFM)
- μ = viscosity (lb·s/ft²)
- R_w = well radius (ft.)
- R_i = radius of influence (ft.)
- H = total screen length (ft.)
- P_w = pressure at well (lb/ft²)
- P_{ATM} = atmospheric pressure (lb/ft²)

Example Calculation (Data for 5/6/94):

Convert Barometric Pressure to P_{ATM} in lb/ft²:

$$P_{ATM} = 29.3 \text{ in. Hg} \left(\frac{14.696 \text{ lb/ft}^2}{29.921 \text{ in. Hg}} \right) \left(\frac{12 \text{ in}}{1 \text{ ft}} \right)^2$$

$$\underline{P_{ATM} = 2072}$$

Convert Differential Pressure, V, at Well To Absolute Pressure, P_w, in lb/ft²:

$$P_w = P_{ATM} + V \left(\frac{14.696 \text{ lb/ft}^2}{406.8 \text{ in. H}_2\text{O}} \right) \left(\frac{12 \text{ in}}{1 \text{ ft}} \right)^2$$

$$P_w = 2072 + (-38.5 \text{ in. H}_2\text{O}) \left(\frac{14.696 \text{ lb/ft}^2}{406.8 \text{ in. H}_2\text{O}} \right) \left(\frac{12 \text{ in}}{1 \text{ ft}} \right)^2$$

$$\underline{P_w = 1872}$$

Total Screen Length, H:

$$H = (\# \text{ of wells})(9\text{ft})$$

$$H = (3)(9)$$

$$\underline{H = 27}$$

9
E8
KRF-E8-U2628
26 - 28

9
F1
KRF-F1-U0406
4 - 6

9
F1
KRF-F1-U1012
10 - 12

9
F1
KRF-F1-U1820
18 - 20

PARAMETER

418.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)
Hydrocarbons

[1] 6910 (147) [5] 1240 (33.6) [1] 5440 (158) [5]

V8240 - Volatile Organics (ug/kg)

1,1,1-Trichloroethane	NA	ND	(1.83)	[1]	NA	NA
1,1,1,2,2-Tetrachloroethane	NA	ND	(4.98)	[1]	NA	NA
1,1,1,2-Trichloroethane	NA	ND	(1.5)	[1]	NA	NA
1,1,1-Dichloroethane	NA	ND	(1.68)	[1]	NA	NA
1,1,1-Dichloroethene	NA	ND	(2.52)	[1]	NA	NA
1,1,2-Dichloroethane	NA	ND	(1.7)	[1]	NA	NA
1,2-Dichloropropane	NA	ND	(2.57)	[1]	NA	NA
2-Chloroethyl vinyl ether	NA	ND	(2.81)	[1]	NA	NA
2-Hexanone	NA	ND	(0.941)	[1]	NA	NA
4-Methyl-2-Pentanone(MIBK)	NA	ND	(0.898)	[1]	NA	NA
Acetone	NA	13.7 B	(1.47)	[1]	NA	NA
Benzene	NA	ND	(1.89)	[1]	NA	NA
Bromodichloromethane	NA	ND	(1.6)	[1]	NA	NA
Bromomethane	NA	ND	(1.97)	[1]	NA	NA
Carbon disulfide	NA	ND	(2.54)	[1]	NA	NA
Carbon tetrachloride	NA	ND	(1.96)	[1]	NA	NA
Chlorobenzene	NA	9.95	(4.56)	[1]	NA	NA
Chloroethane	NA	ND	(2.01)	[1]	NA	NA
Chloroform	NA	ND	(2.05)	[1]	NA	NA
Chloromethane	NA	ND	(2.39)	[1]	NA	NA
Dibromochloromethane	NA	ND	(1.8)	[1]	NA	NA
Ethyl benzene	NA	ND	(1.62)	[1]	NA	NA
Methyl ethyl ketone	NA	8.07 B	(1.5)	[1]	NA	NA
Methylene Chloride	NA	4.92	(2.56)	[1]	NA	NA
Styrene	NA	ND	(1.59)	[1]	NA	NA
Tetrachloroethene	NA	ND	(4.66)	[1]	NA	NA
Toluene	NA	2.93	(1.67)	[1]	NA	NA
Tribromomethane(Bromoform)	NA	ND	(1.48)	[1]	NA	NA
Trichloroethene	NA	ND	(4.77)	[1]	NA	NA
Vinyl Chloride	NA	ND	(2.03)	[1]	NA	NA
Vinyl acetate	NA	ND	(10.8)	[1]	NA	NA
Xylene (total)	NA	ND	(3.57)	[1]	NA	NA
cis-1,3-Dichloropropene	NA	ND	(1.58)	[1]	NA	NA

Compiled: 22 June 1994

() = Detection Limit

[] = Dilution Factor

ND = Not Detected

NA = Not Applicable

* - Value considered suspect, Refer to QC Report

9
E7
KRF-E7-U0204
2 - 4

9
E7
KRF-E7-U1214
12 - 14

9
E8
KRF-E8-U0608
6 - 8

9
E8
KRF-E8-U2426
24 - 26

PARAMETER

V8240 - Volatile Organics, cont. (ug/kg)

trans-1,2-Dichloroethene	ND	(2.34)	[1]	NA	ND	(2.41)	[1]	NA
trans-1,3-Dichloropropene	ND	(1.74)	[1]	NA	ND	(1.8)	[1]	NA

V8270 - Semivolatile Organics (ug/g)

1,1,2,4-Trichlorobenzene	ND	(0.0176)	[1]	NA	ND	(0.0357)	[1]	NA
1,2-Dichlorobenzene	ND	(0.0245)	[1]	NA	< DL	(0.0302)	[1]	NA
1,3-Dichlorobenzene	ND	(0.0223)	[1]	NA	ND	(0.0183)	[1]	NA
1,4-Dichlorobenzene	ND	(0.0292)	[1]	NA	ND	(0.0287)	[1]	NA
2,4,5-Trichlorophenol	ND	(0.022)	[1]	NA	ND	(0.0286)	[1]	NA
2,4,6-Trichlorophenol	ND	(0.0262)	[1]	NA	ND	(0.0206)	[1]	NA
2,4-Dichlorophenol	ND	(0.0347)	[1]	NA	ND	(0.00922)	[1]	NA
2,4-Dimethylphenol	ND	(0.0322)	[1]	NA	ND	(0.036)	[1]	NA
2,4-Dinitrophenol	ND	(0.0447)	[1]	NA	ND	(0.114)	[1]	NA
2,4-Dinitrotoluene	ND	(0.0273)	[1]	NA	ND	(0.0205)	[1]	NA
2,6-Dinitrotoluene	ND	(0.0298)	[1]	NA	ND	(0.0323)	[1]	NA
2-Chloronaphthalene	ND	(0.0262)	[1]	NA	ND	(0.0469)	[1]	NA
2-Chlorophenol	ND	(0.0226)	[1]	NA	ND	(0.0276)	[1]	NA
2-Methylnaphthalene	ND	(0.0232)	[1]	NA	ND	(0.0297)	[1]	NA
2-Methylphenol	ND	(0.0125)	[1]	NA	ND	(0.0259)	[1]	NA
2-Nitroaniline	ND	(0.0295)	[1]	NA	ND	(0.0469)	[1]	NA
2-Nitrophenol	ND	(0.0296)	[1]	NA	ND	(0.0282)	[1]	NA
3,3'-Dichlorobenzidine	ND	(0.0357)	[1]	NA	ND	(0.022)	[1]	NA
3-Nitroaniline	ND	(0.0311)	[1]	NA	ND	(0.0351)	[1]	NA
4,6-Dinitro-2-methylphenol	ND	(0.0392)	[1]	NA	ND	(0.0398)	[1]	NA
4-Bromophenyl phenyl ether	ND	(0.0167)	[1]	NA	ND	(0.0359)	[1]	NA
4-Chloro-3-methylphenol	ND	(0.016)	[1]	NA	ND	(0.0271)	[1]	NA
4-Chlorophenyl phenyl ether	ND	(0.0187)	[1]	NA	ND	(0.0234)	[1]	NA
4-Methylphenol/3-Methylphenol	ND	(0.0146)	[1]	NA	ND	(0.0179)	[1]	NA
4-Nitroaniline	ND	(0.0435)	[1]	NA	ND	(0.0444)	[1]	NA
4-Nitrophenol	ND	(0.0463)	[1]	NA	ND	(0.114)	[1]	NA
Acenaphthene	ND	(0.0255)	[1]	NA	ND	(0.0296)	[1]	NA
Acenaphthylene	ND	(0.0253)	[1]	NA	ND	(0.0259)	[1]	NA
Anthracene	ND	(0.0305)	[1]	NA	ND	(0.024)	[1]	NA
Benzo(a)anthracene	0.0787	(0.0237)	[1]	NA	0.0309	(0.0225)	[1]	NA
Benzo(a)pyrene	0.0831	(0.0317)	[1]	NA	0.0385	(0.0284)	[1]	NA
Benzo(b)fluoranthene	0.169 F	(0.0419)	[1]	NA	0.0987 F	(0.0287)	[1]	NA

Compiled: 22 June 1994

() = Detection Limit □ = Dilution Factor ND = Not Detected NA = Not Applicable * = Value considered suspect, Refer to QC Report

PARAMETER

8270 - Semivolatile Organics, cont. (ug/g)

benzo(g,h,i)perylene	0.17	(0.134)	[1]	ND	(0.149)	[1]	ND	(0.147)	[1]	ND	(1.33)	[1]
benzo(k)fluoranthene	1.04 F	(0.13)	[1]	ND	(0.145)	[1]	ND	(0.143)	[1]	ND	(1.29)	[1]
benzoic acid	ND	(3.09)	[1]	ND	(3.45)	[1]	ND	(3.4)	[1]	ND	(30.6)	[1]
benzyl alcohol	ND	(0.0638)	[1]	ND	(0.0712)	[1]	ND	(0.0701)	[1]	ND	(0.632)	[1]
butylbenzylphthalate	< DL	(0.216)	[1]	ND	(0.241)	[1]	ND	(0.238)	[1]	ND	(2.14)	[1]
brysene	0.65	(0.118)	[1]	ND	(0.131)	[1]	ND	(0.129)	[1]	ND	(1.16)	[1]
i-n-octylphthalate	ND	(0.0611)	[1]	ND	(0.0681)	[1]	ND	(0.0672)	[1]	ND	(0.605)	[1]
ibenz(a,h)anthracene	ND	(0.119)	[1]	ND	(0.132)	[1]	ND	(0.13)	[1]	ND	(1.17)	[1]
ibenzofuran	< DL	(0.0657)	[1]	ND	(0.0733)	[1]	ND	(0.0722)	[1]	ND	(0.65)	[1]
ibutylphthalate	ND	(0.0586)	[1]	ND	(0.0654)	[1]	ND	(0.0644)	[1]	0.679	(0.58)	[1]
iethylphthalate	ND	(0.0301)	[1]	ND	(0.0335)	[1]	ND	(0.0331)	[1]	ND	(0.298)	[1]
imethylphthalate	ND	(0.0531)	[1]	ND	(0.0592)	[1]	ND	(0.0584)	[1]	ND	(0.526)	[1]
i phenylamine	ND	(0.107)	[1]	ND	(0.119)	[1]	ND	(0.117)	[1]	ND	(1.06)	[1]
luoranthene	1.03	(0.0699)	[1]	0.104	(0.078)	[1]	ND	(0.0768)	[1]	2.19	(0.692)	[1]
luorene	0.0699	(0.0544)	[1]	ND	(0.0607)	[1]	ND	(0.0598)	[1]	ND	(0.539)	[1]
exachlorobenzene	ND	(0.0653)	[1]	ND	(0.0729)	[1]	ND	(0.0718)	[1]	ND	(0.647)	[1]
exachlorobutadiene	ND	(0.122)	[1]	ND	(0.136)	[1]	ND	(0.134)	[1]	ND	(1.21)	[1]
exachlorocyclopentadiene	ND	(0.141)	[1]	ND	(0.157)	[1]	ND	(0.155)	[1]	ND	(1.4)	[1]
exachloroethane	ND	(0.0655)	[1]	ND	(0.073)	[1]	ND	(0.0719)	[1]	ND	(0.648)	[1]
indeno(1,2,3-cd)pyrene	0.168	(0.105)	[1]	ND	(0.117)	[1]	ND	(0.115)	[1]	ND	(1.04)	[1]
sophorone	ND	(0.0383)	[1]	ND	(0.0427)	[1]	ND	(0.0421)	[1]	ND	(0.379)	[1]
-Nitroso-di-n-propylamine	ND	(0.0731)	[1]	ND	(0.0815)	[1]	ND	(0.0803)	[1]	ND	(0.724)	[1]
aphthalene	ND	(0.0915)	[1]	0.47	(0.102)	[1]	ND	(0.101)	[1]	1.16	(0.906)	[1]
ltrobenzene	ND	(0.0521)	[1]	ND	(0.0581)	[1]	ND	(0.0572)	[1]	ND	(0.515)	[1]
entachlorophenol	ND	(0.113)	[1]	ND	(0.126)	[1]	ND	(0.124)	[1]	ND	(1.12)	[1]
henanthrene	0.336	(0.0783)	[1]	0.126	(0.0873)	[1]	ND	(0.086)	[1]	< DL	(0.775)	[1]
henol	ND	(0.0442)	[1]	ND	(0.0493)	[1]	ND	(0.0486)	[1]	ND	(0.437)	[1]
yrene	0.946	(0.0839)	[1]	< DL	(0.0936)	[1]	ND	(0.0922)	[1]	< DL	(0.831)	[1]
is(2-Chloroethoxy)methane	ND	(0.075)	[1]	ND	(0.0836)	[1]	ND	(0.0824)	[1]	ND	(0.742)	[1]
is(2-Chloroethyl)ether	ND	(0.0578)	[1]	ND	(0.0645)	[1]	ND	(0.0635)	[1]	ND	(0.572)	[1]
is(2-Chloroisopropyl)ether	ND	(0.0525)	[1]	ND	(0.0586)	[1]	ND	(0.0577)	[1]	ND	(0.52)	[1]
is(2-Ethylhexyl)phthalate	< DL	(0.315)	[1]	3.18	(0.351)	[1]	< DL	(0.346)	[1]	18.1	(3.12)	[1]
-Chloroaniline	ND	(0.111)	[1]	ND	(0.124)	[1]	ND	(0.122)	[1]	ND	(1.1)	[1]

846 - Percent Moisture (percent)

percent moisture	16	(0)	[1]	24.3	(0)	[1]	23.1	(0)	[1]	18.9	(0)	[1]
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implied: 22 June 1994

() = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

9
E6
KRF-E6-U0810
8 - 10

9
E6
KRF-E6-U0618
16 - 18

9
E6
KRF-E6-U06180
16 - 18

9
E6
KRF-E6-U02022
20 - 22

PARAMETER

418.1 - Total Recoverable Petroleum Hydrocarbons	(mg/kg)	[5]	3160	(165)	[5]	233	(32.4)	[1]	22700	(615)	[20]
Hydrocarbons	1860										
W8240 - Volatile Organics (ug/kg)											
1,1,1-Trichloroethane	ND	[1]	ND	(41.6)	[20]	ND	(41)	[20]	ND	(2430)	[2000]
1,1,1,2-Tetrachloroethane	ND	[1]	ND	(85.1)	[20]	ND	(83.8)	[20]	ND	(3170)	[2000]
1,1,1,2-Trichloroethane	ND	[1]	ND	(50.8)	[20]	ND	(50)	[20]	ND	(2400)	[2000]
1,1,1-Dichloroethane	ND	[1]	ND	(48.7)	[20]	ND	(48)	[20]	ND	(1910)	[2000]
1,1-Dichloroethane	ND	[1]	ND	(68.7)	[20]	ND	(67.7)	[20]	ND	(4710)	[2000]
1,2-Dichloroethane	ND	[1]	ND	(72.4)	[20]	ND	(71.3)	[20]	ND	(3480)	[2000]
1,2-Dichloropropane	ND	[1]	ND	(45.3)	[20]	ND	(44.6)	[20]	ND	(6580)	[2000]
2-Chloroethyl vinyl ether	ND	[1]	ND	(26.3)	[20]	ND	(25.9)	[20]	ND	(3480)	[2000]
2-Hexanone	ND	[1]	ND	(81.4)	[20]	ND	(80.1)	[20]	ND	(3850)	[2000]
4-Methyl-2-Pentanone(MIBK)	ND	[1]	ND	(70.3)	[20]	ND	(69.2)	[20]	ND	(2600)	[2000]
Acetone	335 B	[1]	ND	(110)	[20]	ND	(108)	[20]	< DL	(14000)	[2000]
Benzene	ND	[1]	ND	(94.8)	[20]	ND	(93.3)	[20]	13100	(1610)	[2000]
Bromodichloromethane	ND	[1]	ND	(60.3)	[20]	ND	(59.4)	[20]	ND	(8810)	[2000]
Bromomethane	ND	[1]	ND	(96.7)	[20]	ND	(95.2)	[20]	ND	(4540)	[2000]
Carbon disulfide	ND	[1]	ND	(89)	[20]	ND	(87.6)	[20]	ND	(3610)	[2000]
Carbon tetrachloride	ND	[1]	ND	(71.9)	[20]	ND	(70.8)	[20]	ND	(3560)	[2000]
Chlorobenzene	12.4	[1]	2310	(57.4)	[20]	1180	(56.5)	[20]	203000	(2480)	[2000]
Chloroethane	ND	[1]	ND	(86.4)	[20]	ND	(85.1)	[20]	ND	(3310)	[2000]
Chloroform	ND	[1]	ND	(38.2)	[20]	ND	(37.6)	[20]	ND	(1480)	[2000]
Chloromethane	ND	[1]	ND	(73.5)	[20]	ND	(72.3)	[20]	ND	(2390)	[2000]
Dibromochloromethane	ND	[1]	ND	(42.9)	[20]	ND	(42.3)	[20]	ND	(1740)	[2000]
Ethyl benzene	ND	[1]	< DL	(62.9)	[20]	< DL	(62)	[20]	< DL	(2700)	[2000]
Methyl ethyl ketone	76.4 B	[1]	ND	(107)	[20]	ND	(105)	[20]	9100 B	(6770)	[2000]
Methylene Chloride	< DL	[1]	ND	(106)	[20]	ND	(104)	[20]	5910	(4540)	[2000]
Styrene	ND	[1]	ND	(45)	[20]	ND	(44.3)	[20]	ND	(2650)	[2000]
Tetrachloroethene	ND	[1]	ND	(68)	[20]	ND	(66.9)	[20]	ND	(3580)	[2000]
Toluene	< DL	[1]	127	(39.5)	[20]	63.5	(38.9)	[20]	ND	(1980)	[2000]
Tribromomethane(Bromoform)	ND	[1]	ND	(53.7)	[20]	ND	(52.9)	[20]	ND	(1190)	[2000]
Trichloroethene	ND	[1]	ND	(51.1)	[20]	ND	(50.3)	[20]	ND	(3830)	[2000]
Vinyl Chloride	ND	[1]	ND	(77.2)	[20]	ND	(76)	[20]	ND	(3020)	[2000]
Vinyl acetate	ND	[1]	ND	(31.1)	[20]	ND	(30.6)	[20]	ND	(2010)	[2000]
Xylene (total)	ND	[1]	228	(123)	[20]	< DL	(121)	[20]	ND	(6230)	[2000]
cis-1,3-Dichloropropene	ND	[1]	ND	(46.6)	[20]	ND	(45.9)	[20]	ND	(1330)	[2000]

Compiled: 22 June 1994

() = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

9
E4
KRF-E4-U0911
9 - 11

9
E4
KRF-E4-U2426
24 - 26

9
E5
KRF-E5-U0406
4 - 6

9
E5
KRF-E5-U0608
6 - 8

PARAMETER

SV8270 - Semivolatile Organics, cont. (ug/g)

Benzo(g,h,i)perylene	ND XY (0.222)	[5]	< DL	(0.0717)	[1]	0.0406	(0.027)	[1]	0.0883	(0.0267)	[1]
Benzo(k)fluoranthene	< DL XY (0.216)	[5]	ND	(0.0936)	[1]	0.244 F	(0.0352)	[1]	0.735 F	(0.0349)	[1]
Benzoic acid	ND XY (5.13)	[5]	ND	(0.639)	[1]	ND	(0.24)	[1]	ND	(0.238)	[1]
Benzyl alcohol	ND XY (0.106)	[5]	ND	(0.0644)	[1]	ND	(0.0242)	[1]	ND	(0.024)	[1]
Butylbenzylphthalate	ND XY (0.359)	[5]	ND	(0.187)	[1]	ND	(0.0705)	[1]	0.0698	(0.0598)	[1]
Chrysene	< DL XY (0.195)	[5]	< DL	(0.0772)	[1]	0.133	(0.029)	[1]	0.388	(0.0288)	[1]
Di-n-octylphthalate	ND XY (0.101)	[5]	ND	(0.0845)	[1]	< DL	(0.0318)	[1]	0.034	(0.0315)	[1]
Dibenz(a,h)anthracene	ND XY (0.197)	[5]	ND	(0.0775)	[1]	ND	(0.0291)	[1]	< DL	(0.0289)	[1]
Dibenzofuran	ND XY (0.109)	[5]	ND	(0.0589)	[1]	ND	(0.0221)	[1]	0.038	(0.0219)	[1]
Diethylphthalate	ND XY (0.0973)	[5]	0.158	(0.0616)	[1]	0.0323	(0.0232)	[1]	ND	(0.023)	[1]
Diethylphthalate	ND XY (0.0499)	[5]	ND	(0.0403)	[1]	ND	(0.0152)	[1]	ND	(0.015)	[1]
Dimethylphthalate	ND XY (0.0881)	[5]	ND	(0.0421)	[1]	ND	(0.0158)	[1]	ND	(0.0157)	[1]
Diphenylamine	ND XY (0.177)	[5]	ND	(0.0981)	[1]	ND	(0.0369)	[1]	ND	(0.0365)	[1]
Fluoranthene	0.265 XY (0.116)	[5]	0.703	(0.0664)	[1]	0.203	(0.025)	[1]	0.872	(0.0247)	[1]
Fluorene	ND XY (0.0902)	[5]	0.179	(0.0551)	[1]	< DL	(0.0207)	[1]	0.0572	(0.0205)	[1]
Hexachlorobenzene	ND XY (0.108)	[5]	ND	(0.0747)	[1]	ND	(0.0281)	[1]	ND	(0.0278)	[1]
Hexachlorobutadiene	ND XY (0.203)	[5]	ND	(0.078)	[1]	ND	(0.0293)	[1]	ND	(0.0291)	[1]
Hexachlorocyclopentadiene	ND XY (0.234)	[5]	ND	(0.226)	[1]	ND	(0.0848)	[1]	ND	(0.084)	[1]
Hexachloroethane	ND XY (0.109)	[5]	ND	(0.0893)	[1]	ND	(0.0336)	[1]	ND	(0.0332)	[1]
Indeno(1,2,3-cd)pyrene	ND XY (0.174)	[5]	ND	(0.0562)	[1]	0.0605	(0.0211)	[1]	0.106	(0.0209)	[1]
Isophorone	ND XY (0.0635)	[5]	ND	(0.081)	[1]	ND	(0.0305)	[1]	ND	(0.0302)	[1]
N-Nitroso-di-n-propylamine	ND XY (0.121)	[5]	ND	(0.0456)	[1]	ND	(0.0172)	[1]	ND	(0.017)	[1]
Naphthalene	ND XY (0.152)	[5]	3.51	(0.0671)	[1]	ND	(0.0252)	[1]	0.0271	(0.025)	[1]
Nitrobenzene	ND XY (0.0863)	[5]	ND	(0.121)	[1]	ND	(0.0454)	[1]	ND	(0.045)	[1]
Pentachlorophenol	ND XY (0.187)	[5]	ND	(0.112)	[1]	ND	(0.0422)	[1]	ND	(0.0418)	[1]
Phenanthrene	0.226 XY (0.13)	[5]	0.271	(0.0862)	[1]	0.128	(0.0324)	[1]	0.581	(0.0321)	[1]
Phenol	ND XY (0.0733)	[5]	ND	(0.0353)	[1]	ND	(0.0133)	[1]	ND	(0.0131)	[1]
Pyrene	0.228 XY (0.139)	[5]	0.0941	(0.0472)	[1]	0.194	(0.0178)	[1]	0.591	(0.0176)	[1]
bis(2-Chloroethoxy)methane	ND XY (0.124)	[5]	ND	(0.0887)	[1]	ND	(0.0334)	[1]	ND	(0.0331)	[1]
bis(2-Chloroethyl)ether	ND XY (0.0959)	[5]	ND	(0.0978)	[1]	ND	(0.0368)	[1]	ND	(0.0364)	[1]
bis(2-Chloroisopropyl)ether	ND XY (0.0871)	[5]	ND	(0.121)	[1]	ND	(0.0454)	[1]	ND	(0.045)	[1]
bis(2-Ethylhexyl)phthalate	ND XY (0.522)	[5]	2.73 B	(0.158)	[1]	0.908 B	(0.0593)	[1]	0.725 B	(0.0588)	[1]
p-Chloroaniline	ND XY (0.185)	[5]	ND	(0.0941)	[1]	ND	(0.0354)	[1]	ND	(0.0351)	[1]

SV846 - Percent Moisture (percent)

Percent moisture	14.8	(0)	[1]	7.6	(0)	[1]	16.7	(0)	[1]	15.6	(0)	[1]
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Compiled: 22 June 1994

() = Detection Limit

[] = Dilution Factor

ND = Not Detected

NA = Not Applicable

* - Value considered suspect, Refer to QC Report

9
E4
KRF-E4-U0911
9 - 11

9
E4
KRF-E4-U2426
24 - 26

9
E5
KRF-E5-U0406
4 - 6

9
E5
KRF-E5-U0608
6 - 8

PARAMETER

18.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)

Hydrocarbons	729	(29.3)	[1]	3660	(54)	[2]	2710	(59.9)	[2]	1530	(29.6)	[1]
2240 - Volatile Organics (ug/kg)												
1,1,1-Trichloroethane	ND	(1.83)	[1]	ND	(1070)	[1000]	ND	(1.86)	[1]	ND	(1.85)	[1]
1,1,2,2-Tetrachloroethane	ND	(4.96)	[1]	ND	(1400)	[1000]	ND	(5.06)	[1]	ND	(5.03)	[1]
1,1,2-Trichloroethane	ND	(1.49)	[1]	ND	(1060)	[1000]	ND	(1.52)	[1]	ND	(1.51)	[1]
1-Dichloroethane	ND	(1.68)	[1]	ND	(841)	[1000]	ND	(1.71)	[1]	ND	(1.7)	[1]
1-Dichloroethene	ND	(2.51)	[1]	ND	(2080)	[1000]	ND	(2.56)	[1]	ND	(2.55)	[1]
2-Dichloroethane	ND	(1.7)	[1]	ND	(1540)	[1000]	ND	(1.73)	[1]	ND	(1.72)	[1]
2-Dichloropropane	ND	(2.56)	[1]	ND	(2900)	[1000]	ND	(2.62)	[1]	ND	(2.6)	[1]
Chloroethyl vinyl ether	ND	(2.8)	[1]	ND	(1540)	[1000]	ND	(2.85)	[1]	ND	(2.84)	[1]
Hexanone	ND	(0.937)	[1]	ND	(1700)	[1000]	ND	(0.956)	[1]	ND	(0.951)	[1]
Methyl-2-Pentanone(MIBK)	ND	(0.894)	[1]	ND	(1150)	[1000]	ND	(0.913)	[1]	ND	(0.908)	[1]
Acetone	194 B	(1.47)	[1]	< DL	(6350)	[1000]	24.8 B	(1.5)	[1]	13 B	(1.49)	[1]
Benzene	< DL	(1.69)	[1]	823	(711)	[1000]	< DL	(1.72)	[1]	< DL	(1.71)	[1]
Bromodichloromethane	ND	(1.59)	[1]	ND	(3890)	[1000]	ND	(1.63)	[1]	ND	(1.62)	[1]
Bromomethane	ND	(1.96)	[1]	ND	(2000)	[1000]	ND	(2)	[1]	ND	(1.99)	[1]
Carbon disulfide	ND	(2.53)	[1]	ND	(1590)	[1000]	ND	(2.58)	[1]	ND	(2.57)	[1]
Carbon tetrachloride	ND	(1.95)	[1]	ND	(1570)	[1000]	ND	(1.99)	[1]	ND	(1.98)	[1]
Chlorobenzene	6.77	(4.54)	[1]	239000	(4720)	[2000]	7.41	(4.63)	[1]	12.6	(4.61)	[1]
Chloroethane	ND	(2)	[1]	ND	(1460)	[1000]	ND	(2.04)	[1]	ND	(2.03)	[1]
Chloroform	ND	(2.04)	[1]	ND	(652)	[1000]	ND	(2.09)	[1]	ND	(2.08)	[1]
Chloromethane	ND	(2.38)	[1]	1350	(1060)	[1000]	ND	(2.43)	[1]	ND	(2.42)	[1]
Bromochloromethane	ND	(1.79)	[1]	ND	(767)	[1000]	ND	(1.83)	[1]	ND	(1.82)	[1]
Ethyl benzene	ND	(1.62)	[1]	1360	(1190)	[1000]	ND	(1.65)	[1]	ND	(1.64)	[1]
Ethyl ethyl ketone	48.1 B	(1.49)	[1]	4370 B	(2990)	[1000]	9.61 B	(1.52)	[1]	8.13 B	(1.51)	[1]
Ethylene Chloride	3.28	(2.55)	[1]	3100	(2000)	[1000]	8.68	(2.61)	[1]	4.33	(2.59)	[1]
Ethylene	ND	(1.58)	[1]	ND	(1170)	[1000]	ND	(1.62)	[1]	ND	(1.61)	[1]
Tetrachloroethene	ND	(4.64)	[1]	ND	(1580)	[1000]	ND	(4.74)	[1]	ND	(4.72)	[1]
Bluene	2.54	(1.66)	[1]	< DL	(871)	[1000]	3.57	(1.7)	[1]	2.57	(1.69)	[1]
Bromomethane(Bromoform)	ND	(1.48)	[1]	ND	(524)	[1000]	ND	(1.51)	[1]	ND	(1.5)	[1]
Trichloroethene	ND	(4.75)	[1]	ND	(1690)	[1000]	ND	(4.85)	[1]	ND	(4.82)	[1]
Vinyl Chloride	ND	(2.02)	[1]	ND	(1330)	[1000]	ND	(2.06)	[1]	ND	(2.05)	[1]
Vinyl acetate	ND	(10.7)	[1]	ND	(887)	[1000]	ND	(10.9)	[1]	ND	(10.9)	[1]
Ethylene (total)	ND	(3.56)	[1]	10300	(2750)	[1000]	ND	(3.63)	[1]	ND	(3.61)	[1]
Is-1,3-Dichloropropene	ND	(1.57)	[1]	ND	(587)	[1000]	ND	(1.6)	[1]	ND	(1.6)	[1]

Compiled: 22 June 1994

() = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect. Refer to QC Report

9
E4
KRF-E4-U0709
7 - 9

9
E3
KRF-E3-U2829
28 - 29

9
E3
KRF-E3-U2022
20 - 22

9
E3
KRF-E3-U1618
16 - 18

PARAMETER

8240 - Volatile Organics, cont. (ug/kg)

trans-1,2-Dichloroethene	ND	(211)	[100]	ND	(22100)	[10000]	NA	NA
trans-1,3-Dichloropropene	ND	(185)	[100]	ND	(19500)	[10000]	NA	NA

8270 - Semivolatile Organics (ug/g)

1,2,4-Trichlorobenzene	ND	(0.107)	[1]	11.5	(1.06)	[1]	NA	NA
1,2-Dichlorobenzene	< DL	(0.0908)	[1]	192	(0.896)	[1]	NA	NA
1,3-Dichlorobenzene	0.334	(0.0552)	[1]	14.2	(0.545)	[1]	NA	NA
1,4-Dichlorobenzene	2.42	(0.0865)	[1]	132	(0.853)	[1]	NA	NA
2,4,5-Trichlorophenol	ND	(0.0861)	[1]	ND	(0.85)	[1]	NA	NA
2,4,6-Trichlorophenol	ND	(0.0619)	[1]	ND	(0.611)	[1]	NA	NA
2,4-Dichlorophenol	ND	(0.0277)	[1]	ND	(0.274)	[1]	NA	NA
2,4-Dimethylphenol	ND	(0.100)	[1]	82.3	(1.07)	[1]	NA	NA
2,4-Dinitrophenol	ND	(0.343)	[1]	ND	(3.39)	[1]	NA	NA
2,4-Dinitrotoluene	ND	(0.0616)	[1]	ND	(0.608)	[1]	NA	NA
2,6-Dinitrotoluene	ND	(0.097)	[1]	ND	(0.958)	[1]	NA	NA
2-Chloronaphthalene	ND	(0.141)	[1]	ND	(1.39)	[1]	NA	NA
2-Chlorophenol	ND	(0.083)	[1]	ND	(0.82)	[1]	NA	NA
2-Methylnaphthalene	0.772	(0.0894)	[1]	152	(0.882)	[1]	NA	NA
2-Methylphenol	ND	(0.078)	[1]	21.7	(0.77)	[1]	NA	NA
2-Nitroaniline	ND	(0.141)	[1]	ND	(1.39)	[1]	NA	NA
2-Nitrophenol	ND	(0.0848)	[1]	ND	(0.836)	[1]	NA	NA
3,3'-Dichlorobenzidine	ND	(0.0661)	[1]	ND	(0.652)	[1]	NA	NA
3-Nitroaniline	ND	(0.105)	[1]	ND	(1.04)	[1]	NA	NA
4,6-Dinitro-2-methylphenol	ND	(0.12)	[1]	ND	(1.18)	[1]	NA	NA
4-Bromophenyl phenyl ether	ND	(0.108)	[1]	ND	(1.07)	[1]	NA	NA
4-Chloro-3-methylphenol	ND	(0.0816)	[1]	ND	(0.805)	[1]	NA	NA
4-Chlorophenyl phenyl ether	ND	(0.0704)	[1]	ND	(0.695)	[1]	NA	NA
4-Methylphenol/3-Methylphenol	ND	(0.0537)	[1]	70.2 F	(0.53)	[1]	NA	NA
4-Nitroaniline	ND	(0.134)	[1]	ND	(1.32)	[1]	NA	NA
4-Nitrophenol	ND	(0.342)	[1]	ND	(3.38)	[1]	NA	NA
Acenaphthene	ND	(0.0892)	[1]	1.27	(0.88)	[1]	NA	NA
Acenaphthylene	ND	(0.0778)	[1]	ND	(0.767)	[1]	NA	NA
Anthracene	ND	(0.0721)	[1]	ND	(0.712)	[1]	NA	NA
Benzo(a)anthracene	< DL	(0.0676)	[1]	< DL	(0.667)	[1]	NA	NA
Benzo(a)pyrene	ND	(0.0854)	[1]	< DL	(0.843)	[1]	NA	NA
Benzo(b)fluoranthene	0.0895 F	(0.0862)	[1]	< DL	(0.851)	[1]	NA	NA

Compiled: 22 June 1994

() = Detection Limit

[] = Dilution Factor

ND = Not Detected

NA = Not Applicable

* - Value considered suspect, Refer to QC Report

PARAMETER	9 E2		9 E2		9 E2		9 E3					
	KRF-E2-U0002 0 - 2	KRF-E2-U1012 10 - 12	KRF-E2-U2628 26 - 28	KRF-E3-U1416 14 - 16								
18.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)												
hydrocarbons	1730	(32)	[1]	141	(33.7)	[1]	4440	(147)	[5]	1210	(32.1)	[1]
846 - Percent Moisture (percent)												
percent moisture	22.1	(0)	[1]	26.2	(0)	[1]	15.1	(0)	[1]	22.3	(0)	[1]

9
A2
KRF-A2-U1618D
16 - 18

9
A2
KRF-A2-U2022
20 - 22

9
A2
KRF-A2-U2628
26 - 28

9
E1
KRF-E1-U0002
0 - 2

PARAMETER

SV8270 - Semivolatile Organics, cont. (ug/g)

Benzo(g,h,i)perylene	ND	(0.142)	[1]	ND	(1.41)	[1]	NA	NA
Benzo(k)fluoranthene	0.199 F	(0.138)	[1]	ND	(1.37)	[1]	NA	NA
Benzoic acid	ND	(3.28)	[1]	ND	(32.5)	[1]	NA	NA
Benzyl alcohol	ND	(0.0676)	[1]	ND	(0.671)	[1]	NA	NA
Butylbenzylphthalate	ND	(0.229)	[1]	ND	(2.27)	[1]	NA	NA
Chrysene	< DL	(0.125)	[1]	ND	(1.24)	[1]	NA	NA
Di-n-octylphthalate	ND	(0.0648)	[1]	ND	(0.642)	[1]	NA	NA
Dibenz(a,h)anthracene	ND	(0.126)	[1]	ND	(1.25)	[1]	NA	NA
Dibenzofuran	0.0843	(0.0696)	[1]	0.699	(0.691)	[1]	NA	NA
Dibutylphthalate	< DL	(0.0621)	[1]	ND	(0.616)	[1]	NA	NA
Diethylphthalate	ND	(0.0319)	[1]	ND	(0.316)	[1]	NA	NA
Dimethylphthalate	ND	(0.0563)	[1]	ND	(0.558)	[1]	NA	NA
Diphenylamine	ND	(0.113)	[1]	ND	(1.12)	[1]	NA	NA
Fluoranthene	0.308	(0.0741)	[1]	1.15	(0.735)	[1]	NA	NA
Fluorene	0.171	(0.0577)	[1]	0.762	(0.572)	[1]	NA	NA
Hexachlorobenzene	ND	(0.0692)	[1]	ND	(0.687)	[1]	NA	NA
Hexachlorobutadiene	ND	(0.13)	[1]	ND	(1.28)	[1]	NA	NA
Hexachlorocyclopentadiene	ND	(0.149)	[1]	ND	(1.48)	[1]	NA	NA
Hexachloroethane	ND	(0.0694)	[1]	ND	(0.688)	[1]	NA	NA
Indeno(1,2,3-cd)pyrene	ND	(0.111)	[1]	ND	(1.1)	[1]	NA	NA
Isophorone	ND	(0.0406)	[1]	ND	(0.403)	[1]	NA	NA
N-Nitroso-di-n-propylamine	ND	(0.0775)	[1]	ND	(0.768)	[1]	NA	NA
Naphthalene	0.337	(0.097)	[1]	23.4	(0.962)	[1]	NA	NA
Nitrobenzene	ND	(0.0552)	[1]	ND	(0.547)	[1]	NA	NA
Pentachloropheno]	ND	(0.12)	[1]	ND	(1.19)	[1]	NA	NA
Phenanthrene	0.352	(0.0829)	[1]	1.04	(0.823)	[1]	NA	NA
Phenol	ND	(0.0468)	[1]	1.19	(0.464)	[1]	NA	NA
Pyrene	0.213	(0.0889)	[1]	< DL	(0.882)	[1]	NA	NA
bis(2-Chloroethoxy)methane	ND	(0.0795)	[1]	ND	(0.788)	[1]	NA	NA
bis(2-Chloroethyl)ether	ND	(0.0613)	[1]	ND	(0.608)	[1]	NA	NA
bis(2-Chloroisopropyl)ether	ND	(0.0557)	[1]	ND	(0.552)	[1]	NA	NA
bis(2-Ethylhexyl)phthalate	8.73	(0.334)	[1]	4.08	(3.31)	[1]	NA	NA
p-Chloroaniline	ND	(0.118)	[1]	ND	(1.17)	[1]	NA	NA

SV846 - Percent Moisture (percent)

Percent moisture	20.1	(0)	[1]	22.9	(0)	[1]	9	(0)	[1]	18.9	(0)	[1]
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Compliled: 22 June 1994

() = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

9
A2
KRF-A2-U1618D
16 - 18

9
A2
KRF-A2-U2022
20 - 22

9
A2
KRF-A2-U2628
26 - 28

9
E1
KRF-E1-U0002
0 - 2

PARAMETER

18.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)	12600	(624)	[20]	21200	(646)	[20]	2730	(54.9)	[2]	352	(30.8)	[1]
Hydrocarbons												
8240 - Volatile Organics (ug/kg)												
1,1,1-Trichloroethane	ND	(98.6)	[50]	ND	(2050)	[1000]	NA			NA		
1,1,2,2-Tetrachloroethane	ND	(202)	[50]	ND	(4190)	[1000]	NA			NA		
1,1,2,2-Trichloroethane	ND	(120)	[50]	ND	(2500)	[1000]	NA			NA		
1,1-Dichloroethane	ND	(115)	[50]	ND	(2400)	[1000]	NA			NA		
1,1-Dichloroethene	ND	(163)	[50]	ND	(3380)	[1000]	NA			NA		
1,2-Dichloroethane	ND	(172)	[50]	ND	(3560)	[1000]	NA			NA		
1,2-Dichloropropane	ND	(107)	[50]	ND	(2230)	[1000]	NA			NA		
1-Chloroethyl vinyl ether	ND	(62.4)	[50]	ND	(1300)	[1000]	NA			NA		
2-Hexanone	ND	(193)	[50]	ND	(4000)	[1000]	NA			NA		
2-Methyl-2-Pentanone(MIBK)	ND	(167)	[50]	ND	(3460)	[1000]	NA			NA		
Acetone	ND	(260)	[50]	ND	(5400)	[1000]	NA			NA		
Benzene	< DL	(225)	[50]	< DL	(4660)	[1000]	NA			NA		
Bromodichloromethane	ND	(143)	[50]	ND	(2970)	[1000]	NA			NA		
Bromomethane	ND	(229)	[50]	ND	(4760)	[1000]	NA			NA		
Carbon disulfide	ND	(211)	[50]	ND	(4380)	[1000]	NA			NA		
Carbon tetrachloride	ND	(170)	[50]	ND	(3540)	[1000]	NA			NA		
Chlorobenzene	6430	(136)	[50]	35600	(2820)	[1000]	NA			NA		
Chloroethane	ND	(205)	[50]	ND	(4250)	[1000]	NA			NA		
Chloroform	ND	(90.5)	[50]	ND	(1880)	[1000]	NA			NA		
Chloromethane	ND	(174)	[50]	ND	(3620)	[1000]	NA			NA		
Dibromochloromethane	ND	(102)	[50]	ND	(2110)	[1000]	NA			NA		
Ethyl benzene	330	(149)	[50]	7280	(3100)	[1000]	NA			NA		
Methyl ethyl ketone	ND	(253)	[50]	ND	(5260)	[1000]	NA			NA		
Methylene Chloride	ND	(251)	[50]	ND	(5210)	[1000]	NA			NA		
Styrene	ND	(107)	[50]	ND	(2220)	[1000]	NA			NA		
Tetrachloroethene	ND	(161)	[50]	6470	(3340)	[1000]	NA			NA		
Toluene	< DL	(93.6)	[50]	102000	(1940)	[1000]	NA			NA		
Tribromomethane(Bromoform)	ND	(127)	[50]	ND	(2640)	[1000]	NA			NA		
Trichloroethene	ND	(121)	[50]	33900	(2510)	[1000]	NA			NA		
Vinyl Chloride	ND	(183)	[50]	ND	(3800)	[1000]	NA			NA		
Vinyl acetate	ND	(73.6)	[50]	ND	(1530)	[1000]	NA			NA		
Xylene (total)	776	(291)	[50]	57300	(6040)	[1000]	NA			NA		
cis-1,3-Dichloropropene	ND	(110)	[50]	ND	(2290)	[1000]	NA			NA		

Completed: 22 June 1994

() = Detection Limit [] = Dilution Factor

ND = Not Detected

NA = Not Applicable

* - Value considered suspect. Refer to QC Report

9
A2
KRF-A2-U1012
10 - 12

9
A2
KRF-A2-U10120
10 - 12

9
A2
KRF-A2-U1214
12 - 14

9
A2
KRF-A2-U1618
16 - 18

PARAMETER

W8240 - Volatile Organics, cont. (ug/kg)

trans-1,2-Dichloroethene NA
trans-1,3-Dichloropropene NA

W8270 - Semivolatile Organics (ug/g)

1,1,2,4-Trichlorobenzene	NA	NA	NA	ND	(0.0553)	[1]
1,2-Dichlorobenzene	NA	NA	NA	0.404	(0.0772)	[1]
1,3-Dichlorobenzene	NA	NA	NA	0.735	(0.0703)	[1]
1,4-Dichlorobenzene	NA	NA	NA	5.05	(0.092)	[1]
2,4,5-Trichlorophenol	NA	NA	NA	ND	(0.0691)	[1]
2,4,6-Trichlorophenol	NA	NA	NA	ND	(0.0824)	[1]
2,4-Dichlorophenol	NA	NA	NA	ND	(0.109)	[1]
2,4-Dimethylphenol	NA	NA	NA	ND	(0.101)	[1]
2,4-Dinitrophenol	NA	NA	NA	ND	(0.141)	[1]
2,4-Dinitrotoluene	NA	NA	NA	ND	(0.086)	[1]
2,6-Dinitrotoluene	NA	NA	NA	ND	(0.0937)	[1]
2-Chloronaphthalene	NA	NA	NA	ND	(0.0826)	[1]
2-Chlorophenol	NA	NA	NA	ND	(0.0711)	[1]
2-Methylnaphthalene	NA	NA	NA	2.13	(0.073)	[1]
2-Methylphenol	NA	NA	NA	ND	(0.0395)	[1]
2-Nitroaniline	NA	NA	NA	ND	(0.0928)	[1]
2-Nitrophenol	NA	NA	NA	ND	(0.0932)	[1]
3,3'-Dichlorobenzidine	NA	NA	NA	ND	(0.113)	[1]
3-Nitroaniline	NA	NA	NA	ND	(0.0979)	[1]
4,6-Dinitro-2-methylphenol	NA	NA	NA	ND	(0.123)	[1]
4-Bromophenyl phenyl ether	NA	NA	NA	ND	(0.0527)	[1]
4-Chloro-3-methylphenol	NA	NA	NA	ND	(0.0503)	[1]
4-Chlorophenyl phenyl ether	NA	NA	NA	ND	(0.0588)	[1]
4-Methylphenol/3-Methylphenol	NA	NA	NA	ND	(0.0458)	[1]
4-Nitroaniline	NA	NA	NA	ND	(0.137)	[1]
4-Nitrophenol	NA	NA	NA	ND	(0.146)	[1]
Acenaphthene	NA	NA	NA	ND	(0.0804)	[1]
Acenaphthylenc	NA	NA	NA	ND	(0.0796)	[1]
Anthracene	NA	NA	NA	ND	(0.0959)	[1]
Benzo(a)anthracene	NA	NA	NA	< DL	(0.0748)	[1]
Benzo(a)pyrene	NA	NA	NA	0.189 X	(0.0999)	[1]
Benzo(b)fluoranthene	NA	NA	NA	0.172 XF	(0.132)	[1]

() = Detection Limit □ = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

PARAMETER

SW8270 - Semivolatile Organics, cont. (ug/g)

Benzo(g,h,i)perylene	ND	(1.11)	[1]	0.195	(0.0463)	[1]	0.196	(0.0477)	[1]	0.0581	(0.0463)	[1]
Benzo(k)fluoranthene	ND	(1.08)	[1]	1.03 F	(0.0451)	[1]	1.12 F	(0.0465)	[1]	0.422 F	(0.0451)	[1]
Benzoic acid	ND	(25.7)	[1]	ND	(1.07)	[1]	ND	(1.1)	[1]	ND	(1.07)	[1]
Benzy alcohol	ND	(0.53)	[1]	ND	(0.0221)	[1]	ND	(0.0227)	[1]	ND	(0.0221)	[1]
Butylbenzylphthalate	ND	(1.8)	[1]	ND	(0.0748)	[1]	ND	(0.077)	[1]	ND	(0.0748)	[1]
Chrysene	ND	(0.976)	[1]	0.438	(0.0406)	[1]	0.59	(0.0418)	[1]	0.215	(0.0406)	[1]
Di-n-octylphthalate	ND	(0.508)	[1]	ND	(0.0211)	[1]	ND	(0.0218)	[1]	ND	(0.0211)	[1]
Dibenz(a,h)anthracene	ND	(0.986)	[1]	0.0662	(0.041)	[1]	0.09	(0.0423)	[1]	ND	(0.041)	[1]
Dibenzofuran	ND	(0.546)	[1]	0.041	(0.0227)	[1]	< DL	(0.0234)	[1]	ND	(0.0227)	[1]
Dibutylphthalate	ND	(0.487)	[1]	ND	(0.0203)	[1]	ND	(0.0209)	[1]	0.0431	(0.0203)	[1]
Diethylphthalate	ND	(0.25)	[1]	ND	(0.0104)	[1]	ND	(0.0107)	[1]	ND	(0.0104)	[1]
Dimethylphthalate	ND	(0.441)	[1]	ND	(0.0184)	[1]	ND	(0.0189)	[1]	ND	(0.0184)	[1]
Diphenylamine	ND	(0.886)	[1]	ND	(0.0369)	[1]	ND	(0.038)	[1]	ND	(0.0369)	[1]
Fluoranthene	ND	(0.581)	[1]	0.821	(0.0242)	[1]	1.16	(0.0249)	[1]	0.339	(0.0242)	[1]
Fluorene	ND	(0.452)	[1]	0.0356	(0.0188)	[1]	0.0544	(0.0194)	[1]	ND	(0.0188)	[1]
Hexachlorobenzene	ND	(0.543)	[1]	ND	(0.0226)	[1]	ND	(0.0233)	[1]	ND	(0.0226)	[1]
Hexachlorobutadiene	ND	(1.02)	[1]	ND	(0.0423)	[1]	ND	(0.0435)	[1]	ND	(0.0422)	[1]
Hexachlorocyclopentadiene	ND	(1.17)	[1]	ND	(0.0488)	[1]	ND	(0.0502)	[1]	ND	(0.0488)	[1]
Hexachloroethane	ND	(0.544)	[1]	ND	(0.0226)	[1]	ND	(0.0233)	[1]	ND	(0.0226)	[1]
Indeno(1,2,3-cd)pyrene	ND	(0.87)	[1]	0.183	(0.0362)	[1]	0.185	(0.0373)	[1]	0.0512	(0.0362)	[1]
Isophorone	ND	(0.318)	[1]	ND	(0.0132)	[1]	ND	(0.0136)	[1]	ND	(0.0132)	[1]
N-Nitroso-di-n-propylamine	ND	(0.607)	[1]	ND	(0.0253)	[1]	ND	(0.026)	[1]	ND	(0.0253)	[1]
Naphthalene	ND	(0.761)	[1]	ND	(0.0317)	[1]	ND	(0.0326)	[1]	ND	(0.0316)	[1]
Nitrobenzene	ND	(0.433)	[1]	ND	(0.018)	[1]	ND	(0.0185)	[1]	ND	(0.018)	[1]
Pentachlorophenol	ND	(0.938)	[1]	ND	(0.039)	[1]	ND	(0.0402)	[1]	ND	(0.039)	[1]
Phenanthrene	ND	(0.65)	[1]	0.393	(0.0271)	[1]	0.506	(0.0279)	[1]	0.13	(0.0271)	[1]
Phenol	ND	(0.367)	[1]	ND	(0.0153)	[1]	ND	(0.0157)	[1]	ND	(0.0153)	[1]
Pyrene	ND	(0.697)	[1]	0.652	(0.029)	[1]	0.911	(0.0299)	[1]	0.321	(0.029)	[1]
bis(2-Chloroethoxy)methane	ND	(0.623)	[1]	ND	(0.0259)	[1]	ND	(0.0267)	[1]	ND	(0.0259)	[1]
bis(2-Chloroethyl)ether	ND	(0.48)	[1]	ND	(0.02)	[1]	ND	(0.0206)	[1]	ND	(0.02)	[1]
bis(2-Chloroisopropyl)ether	ND	(0.436)	[1]	ND	(0.0182)	[1]	ND	(0.0187)	[1]	ND	(0.0182)	[1]
bis(2-Ethylhexyl)phthalate	< DL	(2.62)	[1]	1.32	(0.109)	[1]	0.126	(0.112)	[1]	0.586	(0.109)	[1]
p-Chloroaniline	ND	(0.926)	[1]	ND	(0.0385)	[1]	ND	(0.0397)	[1]	ND	(0.0385)	[1]

SW846 - Percent Moisture (percent)

Percent moisture	5.16	(0)	[1]	18.8	(0)	[1]	20.4	(0)	[1]	18.6	(0)	[1]
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Completed: 22 June 1994

() = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

PARAMETER

118.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)

2240	(52.6)	[2]	2330	(154)	[5]	203	(31.3)	[1]	1530	(30.6)	[1]
ND	(166)	[100]	ND	(1.94)	[1]	ND	(1.97)	[1]	ND	(1.93)	[1]
1,1,1,1-Trichloroethane	(339)	[100]	ND	(5.26)	[1]	ND	(5.35)	[1]	ND	(5.25)	[1]
1,1,1,2,2-Tetrachloroethane	(202)	[100]	ND	(1.58)	[1]	ND	(1.61)	[1]	ND	(1.58)	[1]
1,1,1,2-Trichloroethane	(194)	[100]	ND	(1.78)	[1]	ND	(1.81)	[1]	ND	(1.77)	[1]
1,1,1,1-Dichloroethane	(274)	[100]	ND	(2.66)	[1]	ND	(2.7)	[1]	ND	(2.66)	[1]
1,1,1,1,1-Pentachloroethane	(288)	[100]	ND	(1.8)	[1]	ND	(1.83)	[1]	ND	(1.8)	[1]
1,2-Dichloroethane	(180)	[100]	ND	(2.72)	[1]	ND	(2.77)	[1]	ND	(2.72)	[1]
1,2-Dichloropropane	(105)	[100]	ND	(2.97)	[1]	ND	(3.02)	[1]	ND	(2.96)	[1]
2-Chloroethyl vinyl ether	(324)	[100]	ND	(0.995)	[1]	ND	(1.01)	[1]	ND	(0.992)	[1]
2-Hexanone	(280)	[100]	ND	(0.949)	[1]	ND	(0.965)	[1]	ND	(0.947)	[1]
4-Methyl-2-Pentanone(MIBK)	(437)	[100]	7.63 B	(1.56)	[1]	12.3 B	(1.58)	[1]	7.79 B	(1.55)	[1]
Acetone	(378)	[100]	< DL	(1.79)	[1]	< DL	(1.82)	[1]	< DL	(1.79)	[1]
Benzene	(240)	[100]	ND	(1.69)	[1]	ND	(1.72)	[1]	ND	(1.69)	[1]
Bromodichloromethane	(385)	[100]	ND	(2.09)	[1]	ND	(2.12)	[1]	ND	(2.08)	[1]
Bromomethane	(355)	[100]	ND	(2.69)	[1]	ND	(2.73)	[1]	ND	(2.68)	[1]
Carbon disulfide	(286)	[100]	ND	(2.07)	[1]	ND	(2.11)	[1]	ND	(2.07)	[1]
Carbon tetrachloride	(229)	[100]	8.38	(4.82)	[1]	8.39	(4.9)	[1]	7.6	(4.81)	[1]
Chlorobenzene	(344)	[100]	ND	(2.12)	[1]	ND	(2.16)	[1]	ND	(2.12)	[1]
Chloroethane	(152)	[100]	ND	(2.17)	[1]	ND	(2.21)	[1]	ND	(2.17)	[1]
Chloroform	(293)	[100]	ND	(2.53)	[1]	ND	(2.57)	[1]	ND	(2.52)	[1]
Chloromethane	(171)	[100]	ND	(1.9)	[1]	ND	(1.93)	[1]	ND	(1.9)	[1]
Dibromochloromethane	(251)	[100]	ND	(1.72)	[1]	ND	(1.74)	[1]	ND	(1.71)	[1]
Ethyl benzene	(426)	[100]	13.7 B	(1.58)	[1]	13 B	(1.61)	[1]	12.8 B	(1.58)	[1]
Methyl ethyl ketone	(422)	[100]	< DL	(2.71)	[1]	2.82	(2.75)	[1]	4.01	(2.7)	[1]
Methylene Chloride	(179)	[100]	ND	(1.68)	[1]	ND	(1.71)	[1]	ND	(1.68)	[1]
Styrene	(271)	[100]	ND	(4.93)	[1]	ND	(5.01)	[1]	ND	(4.92)	[1]
Tetrachloroethene	(157)	[100]	2.12	(1.77)	[1]	2.09	(1.79)	[1]	2.66	(1.76)	[1]
Toluene	(214)	[100]	ND	(1.57)	[1]	ND	(1.6)	[1]	ND	(1.57)	[1]
Tribromomethane(Bromoform)	(204)	[100]	ND	(5.04)	[1]	ND	(5.12)	[1]	ND	(5.03)	[1]
Trichloroethene	(307)	[100]	ND	(2.15)	[1]	ND	(2.18)	[1]	ND	(2.14)	[1]
Vinyl Chloride	(124)	[100]	ND	(11.4)	[1]	ND	(11.6)	[1]	ND	(11.3)	[1]
Vinyl acetate	(489)	[100]	ND	(3.78)	[1]	ND	(3.84)	[1]	ND	(3.77)	[1]
Xylene (total)	(186)	[100]	ND	(1.67)	[1]	ND	(1.69)	[1]	ND	(1.66)	[1]
cis-1,3-Dichloropropene											

() = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to QC Report

9
AI
KRF-A1-U0002
0 - 2

9
AI
KRF-A1-U1618
16 - 18

9
AI
KRF-A1-U1618D
16 - 18

9
AI
KRF-A1-U1820
18 - 20

PARAMETER

8270 - Semivolatile Organics, cont. (ug/g)

4-Chlorophenyl phenyl ether	ND	(0.0192)	[1]	NA	NA	ND	(0.573)	[1]
4-Methylphenol/3-Methylphenol	ND	(0.015)	[1]	NA	NA	0.922 F	(0.447)	[1]
4-Nitroaniline	ND	(0.0449)	[1]	NA	NA	ND	(1.34)	[1]
4-Nitrophenol	ND	(0.0477)	[1]	NA	NA	ND	(1.42)	[1]
Acenaphthene	0.0275	(0.0263)	[1]	NA	NA	ND	(0.784)	[1]
Acenaphthylene	ND	(0.0261)	[1]	NA	NA	ND	(0.776)	[1]
Anthracene	0.0405	(0.0314)	[1]	NA	NA	< DL	(0.935)	[1]
Benzo(a)anthracene	0.303	(0.0245)	[1]	NA	NA	< DL	(0.729)	[1]
Benzo(a)pyrene	0.295	(0.0327)	[1]	NA	NA	ND	(0.974)	[1]
Benzo(b)fluoranthene	0.621 F	(0.0432)	[1]	NA	NA	< DL	(1.29)	[1]
Benzo(g,h,i)perylene	0.169	(0.0465)	[1]	NA	NA	ND	(1.38)	[1]
Benzo(k)fluoranthene	0.621 F	(0.0453)	[1]	NA	NA	< DL	(1.35)	[1]
Benzoic acid	ND	(1.07)	[1]	NA	NA	ND	(32)	[1]
Benzyl alcohol	ND	(0.0221)	[1]	NA	NA	ND	(0.66)	[1]
Butylbenzylphthalate	ND	(0.075)	[1]	NA	NA	ND	(2.24)	[1]
Chrysene	0.355	(0.0408)	[1]	NA	NA	< DL	(1.21)	[1]
Di-n-octylphthalate	ND	(0.0212)	[1]	NA	NA	ND	(0.632)	[1]
Dibenz(a,h)anthracene	0.0563	(0.0412)	[1]	NA	NA	ND	(1.23)	[1]
Dibenzofuran	< DL	(0.0228)	[1]	NA	NA	ND	(0.679)	[1]
Dibutylphthalate	ND	(0.0203)	[1]	NA	NA	1.26	(0.606)	[1]
Diethylphthalate	ND	(0.0104)	[1]	NA	NA	ND	(0.311)	[1]
Dimethylphthalate	ND	(0.0184)	[1]	NA	NA	ND	(0.549)	[1]
Diphenylamine	ND	(0.037)	[1]	NA	NA	ND	(1.1)	[1]
Fluoranthene	0.679	(0.0243)	[1]	NA	NA	5.18	(0.723)	[1]
Fluorene	0.0231	(0.0189)	[1]	NA	NA	ND	(0.562)	[1]
Hexachlorobenzene	ND	(0.0227)	[1]	NA	NA	ND	(0.675)	[1]
Hexachlorobutadiene	ND	(0.0424)	[1]	NA	NA	ND	(1.26)	[1]
Hexachlorocyclopentadiene	ND	(0.0489)	[1]	NA	NA	ND	(1.46)	[1]
Hexachloroethane	ND	(0.0227)	[1]	NA	NA	ND	(0.677)	[1]
Indeno(1,2,3-cd)pyrene	0.146	(0.0363)	[1]	NA	NA	ND	(1.08)	[1]
Isophorone	ND	(0.0133)	[1]	NA	NA	ND	(0.396)	[1]
N-Nitroso-di-n-propylamine	ND	(0.0254)	[1]	NA	NA	ND	(0.756)	[1]
Naphthalene	ND	(0.0318)	[1]	NA	NA	9.45	(0.946)	[1]
Nitrobenzene	ND	(0.0181)	[1]	NA	NA	ND	(0.538)	[1]
Pentachlorophenol	ND	(0.0392)	[1]	NA	NA	ND	(1.17)	[1]
Phenanthrene	0.223	(0.0272)	[1]	NA	NA	3.07	(0.809)	[1]

Completed: 22 June 1994

() = Detection Limit [] = Dilution Factor

ND = Not Detected

NA = Not Applicable

* - Value considered suspect, Refer to QC Report

TABLE A ALL RESULTS OF ORGANIC ANALYSES FOR SOIL SAMPLES, SITE '**', RF Heating, Kelly AFB.

SITE ID									
LOCATION ID									
SAMPLE ID									
BEG. DEPTH - END DEPTH (FT.)									
9									
AI									
KRF-A1-U1618									
16 - 18									
KRF-A1-U1618D									
16 - 18									
9									
AI									
KRF-A1-U1820									
18 - 20									
PARAMETER									
KRF-A1-U0002									
0 - 2									
AI									
KRF-A1-U0002									
0 - 2									
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APPENDIX M



Science Applications International Corporation
An Employee-Owned Company

November 28, 1994

Clifton F. Blanchard
Brown & Root Environmental
Jackson Plaza, Suite A-600
800 Oak Ridge Turnpike
Oak Ridge, TN 37830

Re: EPA Contract No. 68-CO-0048, WA 0-49
SAIC Project No. 01-0832-07-1123-014

Dear Cliff:

Peggy Groeber asked me to send you the enclosed final pretreatment soil and water data from the KAI RFH demonstration.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

A handwritten signature in cursive script, reading "Sharon Krietemeyer".

Sharon Krietemeyer
Chemical Engineer

SMK/smk

Encl.

cc: M. Groeber (w/o enclosure)

smk:cliff.let

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	6/21/94	6/21/94	6/22/94	6/22/94	6/23/94	6/23/94	6/24/94
Time	8:56	17:43	8:28	16:14	7:48	18:42	19:10
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-6.0	-7.0	-6.0	-8.0	-7.0	-8.0	-6.0
E2	-7.0	-7.0	-6.0	-8.0	-7.0	-8.0	-6.0
E3	-7.0	-7.0	-6.0	-8.0	-7.0	-8.0	-7.0
E4	-0.8	-0.9	-0.9	-1.0	-0.9	-1.0	-0.9
E5	-0.7	-0.9	-0.9	-0.9	-0.8	-0.9	-1.0
E6	-0.8	-0.9	-0.8	-1.0	-0.9	-1.0	-0.4
E7	-0.5	-0.6	-0.6	-0.6	-0.5	-0.6	-0.6
E8	-0.8	-1.0	-1.1	-1.0	-0.9	-1.0	-1.1
HE	-0.1	-0.2	-0.1	-0.2	-0.2	-0.2	-0.1
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	-0.5	-0.7	-0.5	-0.7	-0.6	-0.6	-0.5
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
TD6	-0.4	-0.6	-0.5	-0.6	-0.6	-0.7	-0.5
TD7	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
TD8	-0.1	-0.2	-0.3	-0.3	-0.2	-0.3	-0.3
Suction	-11.0	-10.0	-12.0	-11.0	-12.0	-11.0	-12.0
Discharge	14.0	12.0	16.0	14.0	15.0	14.0	14.0
Compressor	387.5	387.5	387.5	387.5	387.5	415.2	387.5
Flare	11.1	11.1	11.1	11.1	11.1	11.1	11.1

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	40	40	40	40	40	40
Flare	65	60	60	60	70	70	65

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	46.1	45.9	45.4	45.4	44.9	44.8	44.3
A2	74.1	73.3	71.5	71.3	69.3	68.3	67.1

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	28.0	33.5	27.6	34.0	25.4	29.4	?
E1	34.7	34.7	31.8	36.6	31.5	36.3	34.6
E2	40.8	39.8	37.6	40.5	37.0	39.5	39.5
E3	39.7	38.4	37.8	40.7	35.0	9.3	38.6
E4	31.2	29.8	-	34.0	28.0	33.7	41.3
E5	32.0	32.1	-	35.4	-	33.8	33.9
E6	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-
E1,2,&3	33.4	36.1	32.3	37.1	30.8	35.4	35.2
E4&5	-	-	-	-	-	-	-
E6,7, &8	-	-	-	-	-	-	-
Christmas Tree	31.1	33.3	32.2	33.3	28.3	37.2	32.8
Mixed Vapor	32.2	40.0	32.2	40.6	26.7	37.8	36.7

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	6/9/94	6/10/94	6/10/94	6/10/94	6/11/94	6/11/94	6/12/94	6/12/94	6/13/94	6/13/94	6/14/94	6/14/94
Time	17:52	17:57	10:54	17:57	9:01	17:23	8:37	21:29	8:00	19:22	9:10	17:49
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-0.5	-0.6	-0.6		-0.5	-0.6	-1.0	-0.8	-0.8	-0.9	-0.9	-0.8
E2	-1.3	-1.8	-1.9		-1.6	-1.8	-2.6	-2.4	-2.3	-2.4	-2.3	-2.5
E3	-1.4	-3.2	-3.3		-3.0	-3.3	-4.7	-4.2	-4.1	-4.3	-4.1	-4.4
E4	-6.0	-6.0	-6.0	-49.0	-5.0	-6.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
E5	-6.0	-6.0	-6.0	-72.1	-5.0	-6.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
E6	-1.0	-1.3	-1.3		-1.0	-1.1	-1.7	-1.6	-1.6	-1.6	-1.5	-1.7
E7	-1.0	-1.3	-1.3		-1.3	-1.2	-2.0	-1.8	-1.8	-1.9	-1.8	-2.1
E8	-0.4	-0.8	-0.5		-2.6	-3.0	-4.0	-4.4	-4.4	-4.5	-4.3	-4.6
HE	-0.5	-0.7	-0.7		-0.6	-0.7	-1.0	-0.9	-0.9	-0.9	-0.9	-0.7
TD1	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	-0.1	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	-0.6	-1.3	-1.5		-1.0	-1.2	-1.8	-1.8	-1.7	-2.2	-1.5	-2.1
TD4	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.1	-0.4	-0.4		-0.3	-0.3	-0.4	-0.5	-0.7	-0.6	-0.6	-0.2
TD6	-0.6	-1.6	-1.3		-1.4	-1.3	-2.3	-2.2	-2.1	-2.3	-2.1	-2.7
TD7	-0.2	-0.2	-0.2		-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2
TD8	-0.4	-0.7	-0.7		-0.5	-0.6	-1.0	-0.9	-0.9	-0.9	-0.8	-1.0
Suction	-15.0	-16.0	-15.0		-16.0	-15.0	-19.0	-18.0	-19.0	-19.0	-18.0	-18.0
Discharge	20.0	19.0	19.0		20.0	19.0	25.0	24.0	24.0	24.0	24.0	24.0
Compressor	802.7	802.7	775.1		802.7	830.4	802.7	830.4	830.4	830.4	830.4	802.7
Flare	16.6	13.8	13.8		13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	45	50	50		50	50	50	50	50	55	50	55
Flare	95	90	90		90	90	95	90	105	105	105	100

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	64.9	59.6	60.4		60.0	58.8	60.0	58.6	57.5	56.6	54.7	54.2
A2	111.4	110.2	110.1		119.1	118.4	117.5	115.5	114.0	112.2	109.1	107.6

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	37.0	34.0	33.0		27.0	31.0	26.0	26.0	24.0	28.0	25.0	25.0
E1	-	-	-		-	-	-	-	-	-	-	-
E2	-	-	-		-	-	-	-	-	-	-	-
E3	-	-	-		-	-	-	-	-	-	-	-
E4	49.3	49.3	49.8		46.7	47.5	45.2	44.0	44.0	45.3	43.3	42.2
E5	75.2	73.9	73.1		63.3	63.9	61.6	59.0	57.3	58.4	54.1	51.8
E6	-	-	-		-	-	-	-	-	-	-	-
E7	-	-	-		-	-	-	-	-	-	-	-
E8	-	-	-		-	-	-	-	-	-	-	-
HE	-	-	-		-	-	-	-	-	-	-	-
E1,2,&3	-	-	-		-	-	-	-	-	-	-	-
E4&5	66.2	67.3	68.1		57.5	54.8	52.8	50.0	47.6	50.0	46.0	45.0
E6,7, &8	-	-	-		-	-	-	-	-	-	-	-
Christmas Tree	62.8	63.3	62.2		53.3	50.6	48.3	45.6	43.9	42.8	40.6	38.9
Mixed Vapor	54.4	51.7	51.7		40.6	40.6	40.6	37.8	35.0	36.7	33.3	29.4

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	5/27/94	5/28/94	5/28/94	5/29/94	5/29/94	5/30/94	5/30/94	5/31/94	6/1/94	6/1/94	6/2/94	6/3/94
Time	16:45	8:41	18:25	10:10	17:22	8:55	19:14	17:28	10:18	19:37		10:05
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-0.3	-0.4	-0.4	-0.5	-0.4	-0.4	-0.4	-0.5	-0.5	-0.5		-0.6
E2	-0.9	-1.0	-1.0	-1.0	-1.0	-1.0	-1.2	-1.3	-1.3	-1.3		-1.4
E3	-2.1	-1.9	-2.1	-2.3	-2.6	-2.1	-2.0	-1.6	-1.5	-1.5		-1.4
E4	-9.0	-9.0	-9.0	-8.5	-9.0	-8.0	-8.5	-7.5	-7.0	-7.0		-6.5
E5	-0.8	-9.5	-0.6	-11.5	-9.0	-7.5	-8.0	-7.5	-7.0	-7.2		-6.5
E6	-0.4	-0.6	-0.5	-0.8	-0.6	-0.6	-0.7	-0.8	-0.9	-1.1		-1.0
E7	-1.1	-1.3	-1.2	-1.2	-1.1	-1.0	-1.2	-1.0	-1.0	-1.1		-1.0
E8	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2		-0.2
HE	-8.5	-0.9	-1.1	-1.1	-0.7	-0.7	-0.7	-0.7	-0.6	-0.8		-0.6
TD1	0.0	> -0.1	0.0	> -0.1	0.0	> -0.1	0.0	0.0	0.0	> -0.1		0.0
TD2	0.0	> -0.1	0.0	> -0.1	0.0	> -0.1	0.0	> -0.1	> -0.1	> -0.1		0.0
TD3	-0.7	-0.8	-0.6	-0.7	-0.6	-0.7	-0.6	-0.8	-1.0	-0.7		-0.7
TD4	-0.1	> -0.1	0.0	> -0.1	0.0	> -0.1	0.0	> -0.1	0.0	0.0		0.0
TD5	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4	-0.5	-0.2	-0.1	-0.2		-0.2
TD6	-1.9	-1.6	-1.6	-1.7	-1.6	-1.6	-1.6	-1.2	-0.3	-1.1		-0.9
TD7	> -0.1	-0.1	> -0.1	> -0.1	> -0.1	> -0.1	> -0.1	-0.1	-0.7	-0.2		-0.1
TD8	-0.5	-0.6	-0.5	-0.6	-0.6	-0.2	> -0.1	-0.5	-0.5	-0.8		-0.8
Suction	-18.0	-25.0	-25.0	-19.0	-18.0	-18.0	-24.0	-17.0	-24.0	-16.0		-17.0
Discharge	24.0	28.0	28.0	22.0	21.0	22.0	28.0	28.0	28.5	20.0		22.0
Compressor	719.7	692.0	719.7	3460.1	3487.8	3460.1	719.7	719.7	636.7	3487.8		3543.2
Flare	16.6	16.6	16.6	13.8	13.8	16.6	16.6	16.6	13.8	16.6		16.6

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	45	50	50	52	50	50	45	50	50	45		45
Flare	90	90	85	90	95	95	95	95	95	115		95

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1		143.4	147.1	142.3	146.3	144.3	143.4	148.2	135.5	129.1		
A2		95.7	92.3	87.6	85.6	81.6	88.3	108.9	107.1	86.4		

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	-	26.0	24.0	27.0	36.0	26.0	35.0	36.0	31.0	31.0		
E1	-		-	-	-	-	-	-	-	-		-
E2	-		-	-	-	-	-	-	-	-		-
E3	-	-	-	-	-	-	-	-	-	-		-
E4	92.5	92.3	90.6	89.3	89.5	90.6	80.8	67.8	62.5	65.0		58.6
E5	93.3	57.2	57.7	56.2	57.1	55.6	62.7	65.3	67.5	65.6		66.3
E6	-	-	-	-	-	-	-	-	-	-		-
E7	-	-	-	-	-	-	-	-	-	-		-
E8	-	-	-	-	-	-	-	-	-	-		-
HE	-	-	-	-	-	-	-	-	-	-		-
E1,2,&3	-	-	-	-	-	-	-	-	-	-		-
E4&5	26.0	65.3	66.4	66.7	66.7	67.5	65.9	68.8	68.8	65.0		66.3
E6,7, &8	-	-	-	-	-	-	-	-	-	-		-
Christmas Tree	60.0	60.0	61.7	61.7	63.3	62.2	63.9	65.6	64.4	60.0		63.3
Mixed Vapor	47.8	46.1	47.8	47.8	48.9	48.9	46.1	51.7	51.7	46.1		48.9

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	5/15/94	5/16/94	5/16/94	5/17/94	5/17/94	5/18/94	5/18/94	5/19/94	5/19/94	5/20/94	5/20/94	5/21/94
Time	19:30	8:01	16:21	7:23	16:25	7:48	16:53	17:34	8:55	8:07	15:50	7:28
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	0.0	-0.1	-0.4	-0.3	-0.6	-0.6	-0.8	-1.1	-1.5	-0.4	-0.4	-0.4
E2	-30.0	-22.0	-30.0	-23.0	-30.0	23.0	-24.0	-30.0	-30.0	-12.0	-1.5	-1.8
E3	-30.0	-22.0	-30.0	-23.0	-30.0	-25.0	-24.0	-30.0	-30.0	-9.0	-1.6	-1.8
E4	-0.5	-0.5	-1.9	-1.4	-2.5	-2.6	-3.0	-4.2	-4.5	-1.8	-1.4	-1.5
E5	+	+	-30.0	-23.0	-30.0	-25.0	-21.0	-30.0	-30.0	-11.0	-11.0	-11.0
E6	-0.5	-0.4	-1.5	-1.2	-2.2	-2.0	-2.4	-3.1	-3.3	-1.2	-1.1	-1.1
E7	-0.5	-0.3	-1.7	-1.2	-2.3	-2.3	-2.6	-3.6	-3.8	-1.3	-1.3	-1.5
E8	0.0	atm.	atm.	atm.	atm.	atm.	atm.	atm.	atm.	atm.	atm.	atm.
HE	0.0	0.0	-0.2	-0.2	-0.4	-0.9	-1.3	-2.0	-2.1	-0.7	-0.8	-0.8
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
TD5	0.0	0.0	-0.2	-0.2	-0.3	-0.3	-1.0	-1.1	-1.0	-0.3	-0.2	-0.4
TD6	-0.1	-0.1	-1.8	-1.2	-2.3	-2.3	-3.0	-3.9	-4.2	-1.4	-1.5	-1.8
TD7	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2	0.0	-0.1	-0.1
TD8	0.0	0.0	-0.4	-0.3	-0.8	-1.0	-1.2	-1.7	-1.8	-0.6	-0.6	-0.5
Suction	-46.0	-38.0	-47.0	-28.0	-42.0	-34.0	-33.0	-42.0	-43.0	-24.0	-22.0	-20.0
Discharge	50.0	39.0	50.0	30.0	43.0	36.0	35.0	46.0	48.0	26.0	23.0	23.0
Compressor	387.5	249.1	1439.4	553.6	1245.6	1245.6	1079.6	1910.0	2048.4	581.3	553.6	664.3
Flare	11.1	8.3	13.8	22.1	22.1	22.1	8.3	22.1	16.6	13.8	13.8	13.8

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	35	60	45	55	60	50	70	60	40	40	50
Flare	60	60	95	70	85	90	110	130	140	90	85	85

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	23.0	23.3	23.1	23.7	23.8	23.9	24.0	24.5	24.5	24.4	24.3	110.1
A2	145.2	143.7	126.6	120.1	124.6	110.5	106.8	115.6	121.0	201.5	223.5	179.2

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	26.0	22.0	25.0	22.0	32.0	23.0	33.0	20.0	32.0	21.0	32.0	19.0
E1	-	-	-	-	-	-	-	-	-	21.1	-	19.8
E2	56.0	60.7	54.2	42.6	44.2	37.6	38.8	34.2	34.7	32.6	30.8	19.8
E3	25.1	27.0	28.8	23.5	41.7	26.7	43.5	27.0	45.3	27.3	34.4	22.6
E4	-	-	-	-	-	-	-	-	-	23.5	35.8	24.5
E5	-	-	87.0	85.4	82.6	78.2	74.3	74.5	75.7	74.4	86.6	86.6
E6	-	-	-	-	-	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	32.8	39.5	47.7	35.6	44.2	34.5	39.1	30.1	37.5	28.6	44.7	23.9
E4&5	-	-	-	86.8	82.5	77.3	71.1	70.5	70.3	73.5	73.2	68.6
E6,7, &8	-	-	-	-	-	-	-	-	-	-	-	-
Christmas Tree	29.4	21.1	80.0	77.8	74.4	70.0	63.9	62.8	62.8	64.4	65.6	58.9
Mixed Vapor	28.3	20.0	61.7	63.3	63.3	52.8	51.7	48.9	51.7	47.8	51.7	43.3

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	5/3/94	5/4/94	5/4/94	5/5/94	5/5/94	5/6/94	5/6/94	5/7/94	5/7/94	5/8/94	5/8/94	5/9/94
Time	18:24	9:36	18:00	7:00	17:17	9:23	16:54	11:20	18:10	8:43	15:14	8:35
Well Number	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)
E1	0.0	-0.4	-0.4	-0.4	-0.5	-0.3	-0.1	-0.4	-0.5	-0.5	-0.5	-0.4
E2	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E3	0.1	-0.7	-0.7	-0.8	-0.9	-0.7	-0.9	-1.0	-1.3	-1.5	-1.7	-1.0
E4	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E5	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E6	-1.6	-1.3	-1.3	-1.3	-1.7	-1.2	-1.7	-1.4	-1.7	-1.6	-1.9	-1.5
E7	-1.4	-1.3	-1.3	-1.3	-1.5	-1.1	-1.4	-1.4	-1.7	-1.6	-1.9	-1.5
E8	-0.1	0.0	-0.1	-0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	-0.1	0.0
HE	0.0	0.0	-0.1	0.0	-0.1	-0.1	0.0	-0.1	-0.2	-0.2	-0.3	-0.2
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	-0.1	-1.0	-1.0	-0.9	-1.3	-0.9	-1.3	-1.0	-1.2	-0.1	0.0	0.0
TD3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	0.0	-0.1	-0.1	-0.1	0.0	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2
TD6	-0.5	-0.3	-0.4	-0.3	-0.5	-0.3	-0.4	-0.5	-0.8	-0.9	-1.1	-0.6
TD7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD8	-0.3	-0.2	-0.3	-0.3	-0.4	-0.3	-0.4	-0.3	-0.5	-0.5	-0.6	-0.4
Suction	-40.0	-38.0	-42.0	-38.0	-39.0	-38.0	-39.0	-36.0	-38.0	-36.0	-34.0	-34.0
Discharge	42.0	40.0	39.0	40.0	37.0	37.0	41.0	39.0	40.0	38.0	36.0	36.0
Compressor	415.2	415.2	442.9	415.2	442.9	415.2	442.9	415.2	442.9	387.5	415.2	415.2
Flare	11.1	11.1	11.1	11.1	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	40	40	40	40	40	40	40	40	40	40	40
Flare	60	60	60	60	60	60	60	60	60	60	60	60

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	18.3	18.6	18.8	18.6	18.9	19.1	18.9	19.3	19.3	19.7	19.7	19.8
A2	115.4	134.9	97.5	110.2	128.1	124.4	134.5	99.7	95.4	94.0	89.7	125.9

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	23.0	18.0	24.0	20.0	27.0	23.0	28.0	27.0	32.0	25.0	30.0	24.0
E1	-	-	-	-	-	-	-	-	-	-	-	-
E2	23.7	21.3	27.0	25.1	29.5	29.9	33.0	33.1	33.7	32.5	35.7	31.2
E3	-	-	-	-	-	-	-	-	-	-	-	-
E4	18.1	22.1	28.1	25.3	31.6	30.1	35.3	34.2	37.4	34.3	40.5	33.5
E5	90.6	93.5	86.3	91.2	85.6	82.6	85.5	77.2	72.3	64.3	63.5	89.5
E6	-	-	-	-	-	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	26.7	22.6	27.8	24.6	30.7	29.8	33.7	33.7	34.3	31.5	36.6	30.9
E4&5	57.6	63.0	59.6	65.4	64.8	64.7	70.4	65.2	62.2	53.1	54.8	77.9
E6,7, &8	-	-	-	-	-	-	-	-	-	-	-	-
Christmas Tree	28.3	20.6	35.6	29.4	36.1	38.9	47.2	46.1	46.7	37.8	43.3	56.7
Mixed Vapor	23.3	15.6	26.1	18.9	40.6	23.9	34.4	32.2	35.0	27.2	35.0	35.0

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extraction System

Date	4/22/94	4/23/94	4/23/94	4/24/94	4/24/94	4/24/94	4/25/94	4/25/94	4/25/94	4/26/94	4/26/94	4/26/94
Time	14:41	14:02	9:23	8:12	14:00	20:04	8:00	13:24	18:35	8:03	12:54	16:50
Well Number	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)	Pressure (° H ₂ O)
E1	-1.0	-0.5	-0.5	-0.5	-1.0	-1.0	-1.0	-1.0	-0.5	-0.5	-1.0	-1.0
E2	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E3	-2.0	-1.0	-1.0	-1.0	-2.0	-1.5	-1.5	-2.0	-1.0	-1.5	-1.0	-1.0
E4	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E5	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E6	-3.0	-1.5	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
E7	-2.5	-1.5	-1.5	-2.5	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.5
E8	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	-0.5	0.0	0.0	0.0	0.0
HE	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	-2.0	-1.0	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
TD3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD6	-2.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-0.5	-1.0	-1.0
TD7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD8	-1.5	-0.5	-0.5	-1.0	-1.0	-0.5	-1.0	-1.0	-0.5	-0.5	-0.5	-0.5
Suction	-40.0	-42.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0
Discharge	41.0	45.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	41.0	41.0
Compressor	664.3	442.9	442.9	470.6	470.6	470.6	442.9	442.9	442.9	442.9	442.9	442.9
Flare	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	50	40	40	40	40	40	40	40	40	40	40	40
Flare	60	60	50	60	60	60	60	60	60	60	60	60

Radio Frequency System

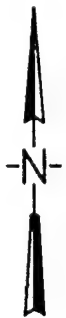
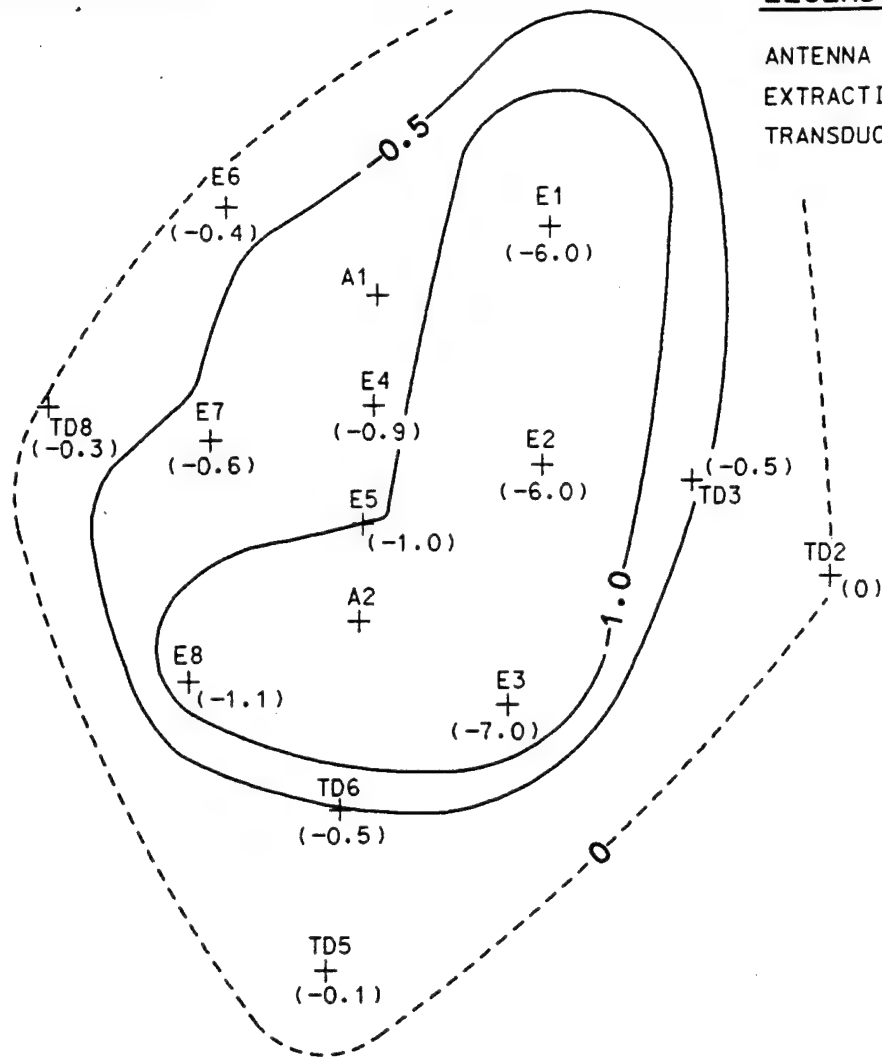
Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	-	-	-	-	-	-	17.2	17.1	-	17.0	17.2	17.4
A2	-	-	-	-	-	-	95.1	95	-	95.0	113.5	95.7

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	30.6	27.8	23.4	19.4	27.1	26.8	22.1	26.0	30.0	23.0	31.0	33.0
E1	30.1	-	-	18.9	-	24.1	21.1	25.3	28.3	21.3	36.0	-
E2	29.3	29.1	22.3	21.8	28.1	26.5	22.8	25.6	28.5	23.2	31.1	31.5
E3	30.7	-	-	19.4	29.2	25.1	21.4	26.3	29.0	22.7	34.1	-
E4	29.4	27.9	21.9	21.7	27.3	26.8	22.9	25.7	29.0	23.3	32.3	32.8
E5	31.5	29.3	23.3	24.2	27.9	28.2	26.3	35.5	48.5	50.8	56.7	52.5
E6	31.7	-	-	19.5	-	24.3	21.8	23.7	25.7	21.7	-	-
E7	31.3	-	-	19.5	-	24.3	21.6	24.0	26.5	22.0	-	-
E8	31.4	-	-	19.7	-	25.0	21.9	25.1	28.3	23.1	-	-
HE	25.8	-	-	19.9	24.7	23.3	21.3	24.4	26.3	23.0	-	-
E1,2,&3	33.8	28.9	23.3	20.8	-	25.3	22.1	26.5	31.1	23.7	36.3	33.8
E4&5	31.9	27.9	22.1	21.6	-	25.2	23.1	27.0	32.7	31.4	39.3	38.0
E6,7, &8	33.4	-	-	19.1	-	25.6	21.6	26.1	29.7	23.1	-	-
Christmas Tree	36.1	28.3	23.3	18.9	27.8	28.9	22.2	26.7	33.9	23.3	32.2	37.8
Mixed Vapor	37.2	32.8	23.3	18.9	30.0	26.1	21.1	26.7	32.8	21.7	34.4	35.6

LEGEND

ANTENNA WELL	A
EXTRACTION WELL	E
TRANSDUCER WELL	TD



6 0 6
SCALE IN FEET

TD4
+
(0)

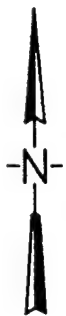
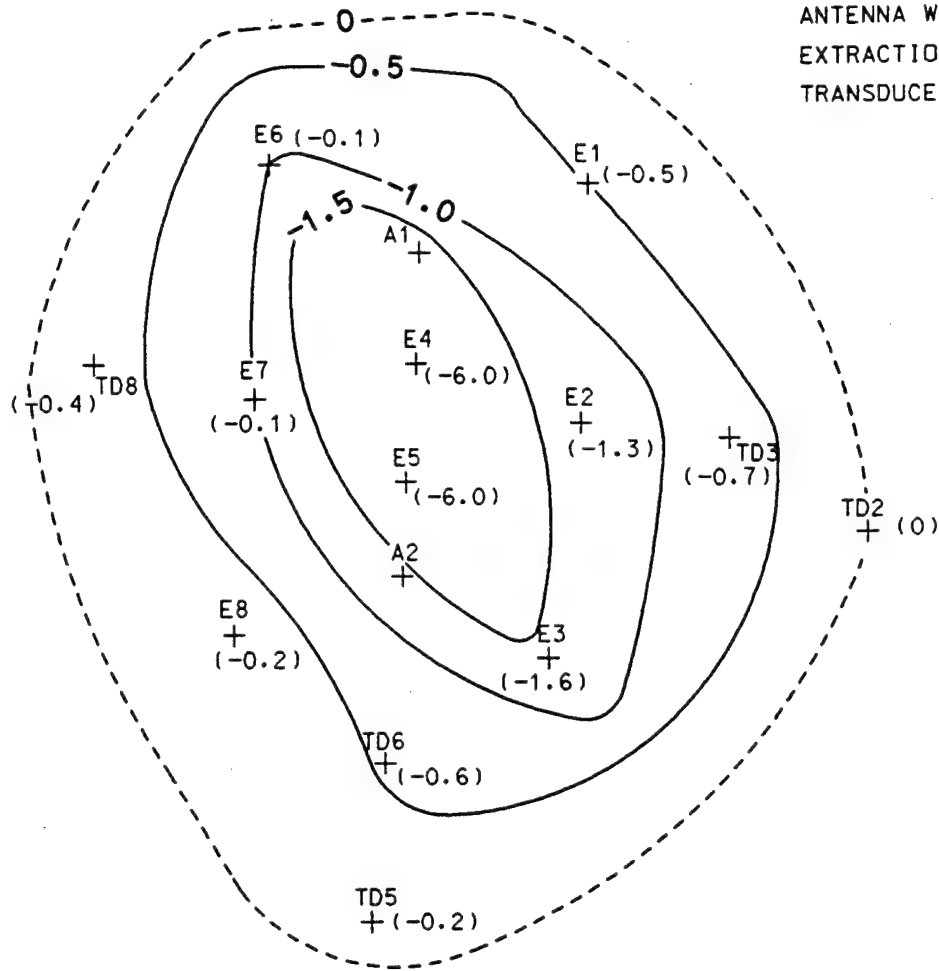
NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.

<p>DRAWN</p> <p>CHECKED</p> <p>GEOLOGIST</p> <p>ENGINEER</p> <p>DISC. MAN.</p> <p>PROJ. MAN.</p>	<p>TITLE</p> <p>SUBSURFACE PRESSURES FOR</p> <p>JUNE 24, 1994</p> <p>KAI DEMONSTRATION</p> <p>RADIO FREQUENCY HEATING</p> <p>DECONTAMINATION DEMONSTRATION</p> <p>SITE S-1</p> <p>KELLY AIR FORCE BASE, TEXAS</p>		
	<p>SCALE</p> <p>AS SHOWN</p>		<p>DATE</p> <p>12-6-94</p>
	<p>DRAWING NO.</p> <p>3688G016</p>		<p>REV.</p> <p>0</p>
	<p>SHEET</p> <p>1 OF 1</p>		

LEGEND

ANTENNA WELL	A
EXTRACTION WELL	E
TRANSDUCER WELL	TD



6 0 6
SCALE IN FEET

TD4
+
(0)

NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.

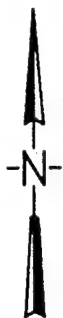
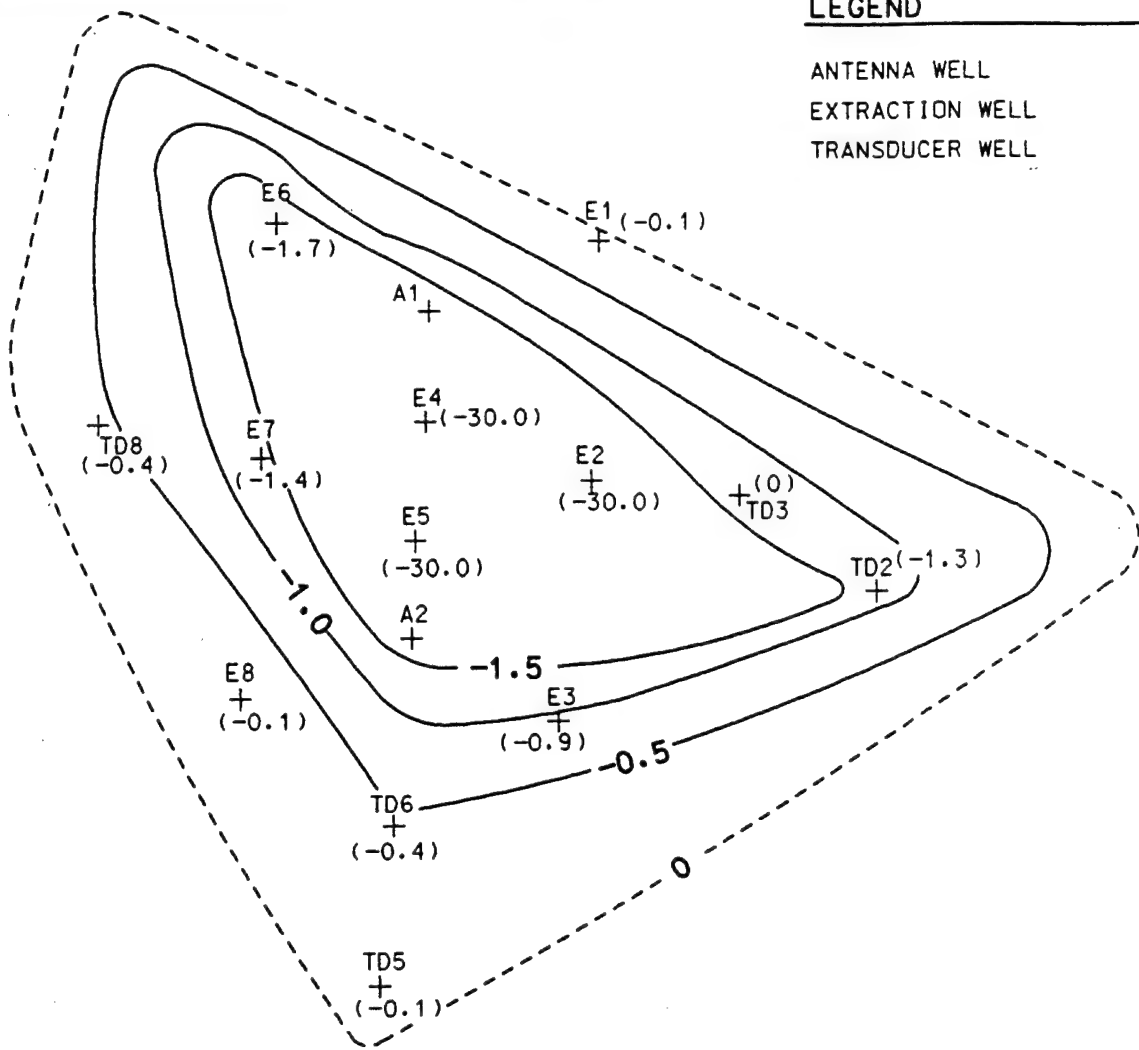
DRAWN
CHECKED
GEOLOGIST
ENGINEER
DISC. MAN.
PROJ. MAN.

TITLE
**SUBSURFACE PRESSURES FOR
JUNE 7, 1994
KAI DEMONSTRATION
RADIO FREQUENCY HEATING
DECONTAMINATION DEMONSTRATION
SITE S-1
KELLY AIR FORCE BASE, TEXAS**

SCALE AS SHOWN	DATE 12-6-94
DRAWING NO. 3688G016	REV. 0 SHEET 1 OF 1

LEGEND

ANTENNA WELL	A
EXTRACTION WELL	E
TRANSDUCER WELL	TD



6 0 6
SCALE IN FEET

TD4
+ (0)

NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.
3. THE 0 VALUE AT TD3 WAS IGNORED FOR THESE CONTOURS.

DRAWN CHECKED GEOLOGIST ENGINEER DISC. MAN. PROJ. MAN.	TITLE SUBSURFACE PRESSURES FOR MAY 6, 1994 KAI DEMONSTRATION RADIO FREQUENCY HEATING DECONTAMINATION DEMONSTRATION SITE S-1 KELLY AIR FORCE BASE, TEXAS		
	SCALE	AS SHOWN	DATE
	DRAWING NO.	3688G016	REV. 0
	SHEET 1 OF 1		

PERMEABILITY CALCULATIONS

Input data into Equation:

$$k = \frac{Q \mu [\ln(R_w / R_i)]}{H \pi P_w [1 - (P_{ATM} / P_w)^2]}$$

$$k = \frac{(31.7 \text{ ASCFM}) (4.6 \times 10^{-7} \text{ lb} \cdot \text{s} / \text{ft}^2) [\ln(0.167 \text{ ft} / 9 \text{ ft})]}{(27 \text{ ft}) \pi (1872 \text{ lb} / \text{ft}^2) \left[1 - \left(\frac{2072 \text{ lb} / \text{ft}^2}{1872 \text{ lb} / \text{ft}^2} \right)^2 \right]} \left(\frac{1 \text{ min}}{60 \text{ s}} \right)$$

$$k = \underline{2.7\text{E-}11 \text{ ft}^2}$$

Convert Vapor Permeability, k in ft² to cm²:

$$K = k \left(\frac{9.29 \times 10^2 \text{ cm}^2}{\text{ft}^2} \right)$$

$$K = 9.7 \times 10^{-11} \left(\frac{9.29 \times 10^2 \text{ cm}^2}{\text{ft}^2} \right)$$

$$k = \underline{2.5\text{E-}08 \text{ cm}^2}$$

Convert Vapor Permeability, k in ft² to darcy:

$$K = k \left(\frac{9.42 \times 10^{10} \text{ cm}^2}{\text{ft}^2} \right)$$

$$K = 9.7 \times 10^{-11} \left(\frac{9.42 \times 10^{10} \text{ cm}^2}{\text{ft}^2} \right)$$

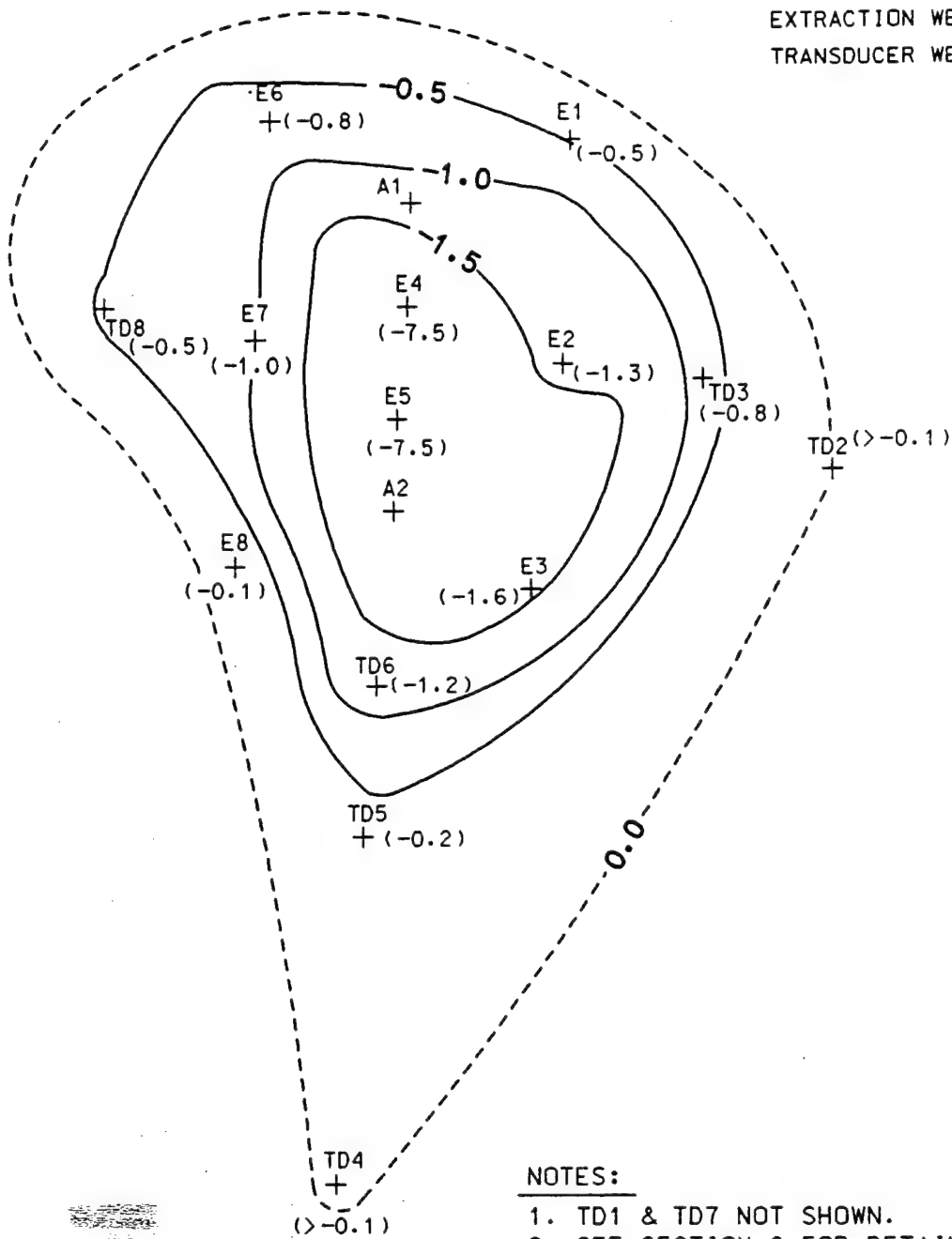
$$K = \underline{2.6 \text{ darcy}}$$

Spreadsheet Calculation for Other Dates:

Data from Demonstration	4/8/94	5/6/94	5/31/94	6/7/94	6/14/94	6/24/94
Flow Rate, Q, (ASCFM)	54.0	31.7	71.4	66.2	75.7	47.5
Number of Wells	2	3	2	2	2	3
Well Radius, R _w , (ft.)	0.167	0.167	0.167	0.167	0.167	0.167
Total Screen Length, H, (ft.)	18	27	18	18	18	27
Differential Pressure at Wells, V, (in. H ₂ O)	-40	-38.5	-7.5	-6.0	-8.0	-6.33
Absolute Pressure at Wells, P _w , (lb/ft ²)	1864	1872	2026	2020	2024	2025
Barometric Pressure (In. Hg)	29.3	29.3	29.2	29.0	29.2	29.1
Atmospheric Pressure, P _{ATM} , (lb/ft ²)	2072	2072	2065	2051	2065	2058
Radius of Influence, R _i , (ft.)	7	9	10	9	12	8
Vapor Temperature (°F)	105	126	157	157	100	116
Estimated Vapor Viscosity, μ (lb·s/ft ²)	4.4E-07	4.6E-07	4.8E-07	4.8E-07	4.4E-07	4.5E-07
Estimated Vapor Permeability, k, (ft ²)	6.4E-11	2.7E-11	5.1E-10	5.9E-10	4.7E-10	2.5E-10
Estimated Vapor Permeability, k, (cm ²)	5.9E-08	2.5E-08	4.7E-07	5.5E-07	4.3E-07	2.3E-07
Estimated Vapor Permeability, k, (darcy)	6.0	2.6	48.2	55.9	43.8	23.7

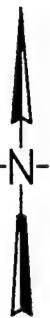
LEGEND

ANTENNA WELL	A
EXTRACTION WELL	E
TRANSDUCER WELL	TD



NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.

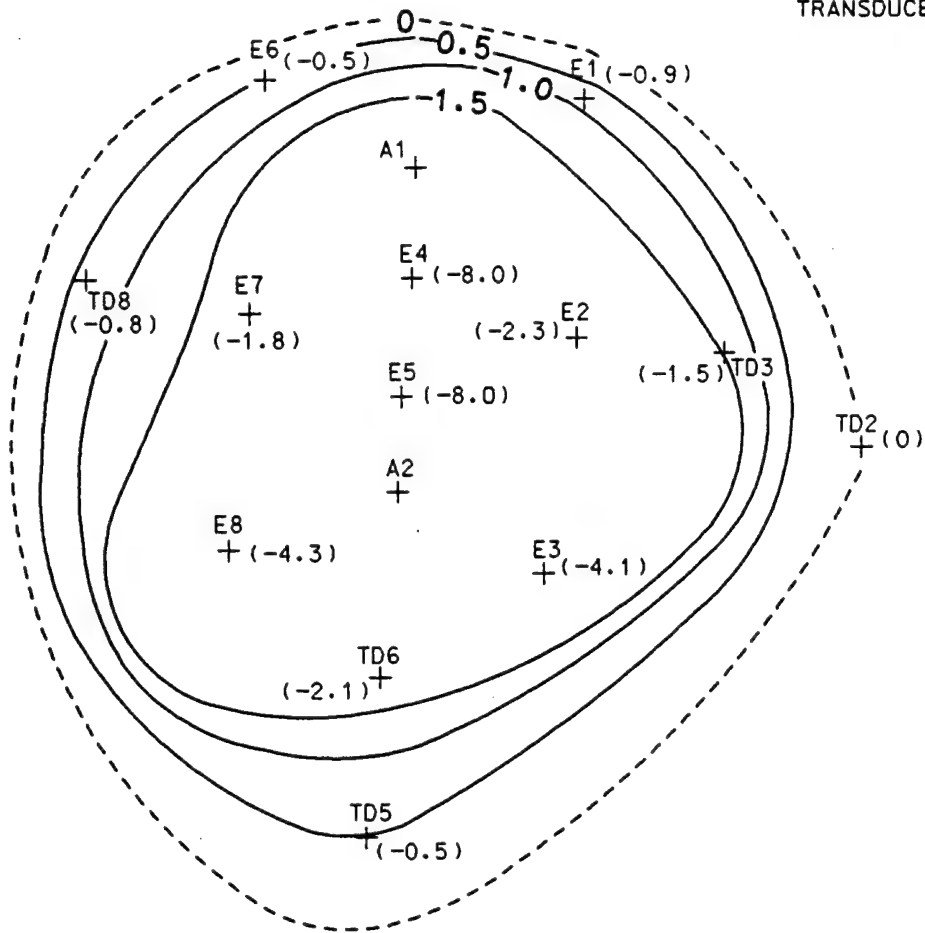


6 0 6
SCALE IN FEET

DRAWN		TITLE	
CHECKED		SUBSURFACE PRESSURES FOR	
GEOLOGIST		MAY 31, 1994	
ENGINEER		KAI DEMONSTRATION	
		RADIO FREQUENCY HEATING	
		DECONTAMINATION DEMONSTRATION	
		SITE S-1	
		KELLY AIR FORCE BASE, TEXAS	
DISC. MAN.		SCALE	DATE
PROJ. MAN.		AS SHOWN	12-6-94
		DRAWING NO.	REV. 0
		3688G016	SHEET 1 OF 1

LEGEND

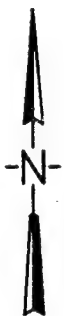
ANTENNA WELL	A
EXTRACTION WELL	E
TRANSDUCER WELL	TD



TD4
+
(0)

NOTES:

1. TD1 & TD7 NOT SHOWN.
2. SEE SECTION 6 FOR DETAILS.



6 0 6

SCALE IN FEET

	DRAWN	TITLE SUBSURFACE PRESSURES FOR JUNE 14, 1994 KAI DEMONSTRATION RADIO FREQUENCY HEATING DECONTAMINATION DEMONSTRATION SITE S-1 KELLY AIR FORCE BASE, TEXAS				
	CHECKED					
	GEOLOGIST					
	ENGINEER					
	DISC. MAN.	SCALE	AS SHOWN	DATE	12-6-94	
	PROJ. MAN.	DRAWING NO.	3688G016	REV.	0	SHEET

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	4/27/94	4/27/94	4/27/94	4/28/94	4/28/94	4/29/94	4/29/94	4/30/94	5/1/94	5/2/94	5/2/94	5/3/94
Time	8:18	13:29	17:12	7:57	15:52	11:20	17:34	18:44	10:52	12:17	19:10	14:00
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-0.5	-0.7	-0.6	-0.5	0.0	0.0	-0.5	-0.7	-0.4	-0.3	-0.3	-0.4
E2	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E3	-1.0	-1.8	-1.4	-1.3	-1.3	-2.1	-1.3	-2.0	-1.3	-1.3	-0.9	-0.9
E4	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E5	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E6	-2.0	-2.3	-2.2	-2.0	-1.5	-2.3	-1.6	-2.3	-1.4	-1.5	-1.3	-1.5
E7	-1.0	0.0	-2.3	-2.0	-2.3	-2.7	0.0	-2.5	-1.8	-1.7	-1.3	-1.4
E8	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0
HE	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	+	0.0	0.0	0.0	-0.1
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	+	0.0
TD2	-1.0	-1.7	-1.4	-0.1	-1.3	-2.7	-1.2	-1.7	-1.2	-1.0	-0.9	-1.0
TD3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
TD6	-0.5	-1.0	-0.7	-0.7	-0.9	-1.1	-0.9	-1.3	-0.9	-0.8	-0.6	-0.5
TD7	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.3
TD8	-0.5	-0.7	-0.6	-0.5	-0.5	-0.5	-0.4	-0.6	-0.4	-0.3	-0.3	0.0
Suction	-43.0	-41.0	-40.0	-41.0	-46.0	-46.0	-39.0	-38.0	-39.0	-45.0	-33.0	-40.0
Discharge	45.0	43.0	43.0	43.0	48.0	48.0	38.0	39.0	41.0	48.0	35.0	43.0
Compressor	498.3	498.3	498.3	470.6	498.3	498.3	415.2	415.2	415.2	415.2	276.8	415.2
Flare	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	11.1	11.1	11.1	11.1

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	40	40	40	40	40	40	40	40	40	40	40
Flare	60	60	60	60	60	60	60	60	60	60	60	60

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	17.1	17.1	17.3	17.1	17.2	17.5	17.5	17.7	17.5	18.0	18.1	18.2
A2	114.0	105.6	109.4	102.8	107.0	104.6	96.5	72.4	69.4	99.5	95.1	104.4

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	24.0	29.0	30.0	24.0	25.0	23.0	21.0	18.0	14.0	21.0	21.0	28.0
E1	-	27.5	-	-	-	-	-	-	-	-	-	-
E2	24.1	28.1	29.0	23.4	24.0	26.4	29.0	23.6	20.1	21.1	22.6	28.5
E3	-	28.6	-	-	-	29.8	-	-	-	-	-	-
E4	24.7	28.8	30.0	24.6	23.5	26.0	28.5	23.4	20.2	21.0	20.1	29.7
E5	56.7	51.6	58.3	56.5	56.4	64.6	62.1	37.2	36.8	62.3	40.7	92.1
E6	-	27.7	-	-	-	-	-	-	-	-	-	-
E7	-	28.6	-	-	-	-	-	-	-	-	-	-
E8	-	28.6	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	24.8	30.8	30.5	24.6	25.0	27.8	29.7	20.1	18.0	21.0	21.4	33.8
E4&5	36.3	36.2	40.1	37.3	31.7	43.2	42.6	22.8	21.7	29.5	22.8	59.5
E6,7, &8	-	30.7	-	-	-	-	-	-	-	-	-	-
Christmas Tree	25.0	31.1	31.1	25.0	26.1	30.0	33.3	19.4	13.3	18.9	23.3	35.0
Mixed Vapor	23.3	15.6	30.0	22.8	26.7	26.7	32.2	18.3	13.3	19.4	21.1	31.1

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	5/9/94	5/10/94	5/10/94	5/11/94	5/11/94	5/12/94	5/12/94	5/13/94	5/13/94	5/14/94	5/14/94	5/15/94
Time	17:40	8:35	16:25	10:04	17:11	7:41	16:45	7:33	18:08	7:56	18:17	10:52
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-0.5	-0.5	-0.5	-0.5	-0.5	-0.8	-0.7	-0.7	-0.1	-0.2	-0.1	-0.1
E2	-30.0	-30.0	-30.0	-30.0	-24.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E3	-30.0	-30.0	-30.0	-30.0	-24.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0
E4	-30.0	-30.0	-30.0	-30.0	-24.0	-30.0	-30.0	-30.0	-0.5	-1.0	-0.5	-0.4
E5	-30.0	-30.0	-30.0	-30.0	-24.0	-30.0	-30.0	-30.0	-0.5	0.0	-0.5	+
E6	-1.8	-1.8	-1.9	-2.1	-1.7	-2.5	-2.5	-2.3	-0.5	-0.8	-0.5	-0.5
E7	-1.7	-1.7	-1.9	-2.2	-1.7	-2.5	-2.5	-2.4	-0.5	-0.6	-0.5	-0.3
E8	0.0	0.0	0.0	-0.1	0.0	-0.1	atm.	atm.	atm.	0.0	atm.	atm.
HE	-0.2	-0.1	-0.1	-0.3	-0.3	-0.7	-0.7	-0.8	+	0.0	0.0	+
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	0.0	0.0	0.0	-0.3	-0.1	-0.2	0.0	-0.1	0.0	0.0	0.0	0.0
TD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.2	-0.2	-0.2	-0.3	-0.2	-0.3	-0.8	-0.3	-0.1	-0.1	0.0	-0.1
TD6	-0.9	-0.9	-1.0	-1.6	-1.0	-1.7	-1.7	-1.8	-0.4	-0.3	-0.1	0.0
TD7	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
TD8	-0.5	-0.5	-0.5	-0.8	-0.5	-1.0	-1.0	-0.9	-0.2	-0.2	0.0	0.0
Suction	-36.0	-36.0	-38.0	-37.0	-31.0	-40.0	-38.0	-34.0	-45.0	-45.0	-45.0	-45.0
Discharge	38.0	34.0	39.0	38.0	33.0	42.0	40.0	36.0	48.0	48.0	48.0	49.0
Compressor	470.6	498.3	525.9	609.0	470.6	1024.2	996.5	1190.3	387.5	387.5	387.5	387.5
Flare	13.8	16.6	13.8	16.6	13.8	19.4	19.4	19.4	13.8	11.1	11.1	11.1

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	40	45	45	45	45	40	50	60	40	40	40	45
Flare	60	65	65	65	65	80	85	85	60	60	60	60

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	19.9	20.1	20.3	20.5	20.6	21.0	20.9	21.3	21.4	22.1	21.8	22.5
A2	130.3	134.1	139.4	115.6	137.0	128.1	126.4	121.5	116.8	142.4	137.8	143.4

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	30.0	24.0	30.0	24.0	28.0	23.0	28.1	23.1	19.0	30.0	17.0	30.0
E1	-	-	-	-	-	-	-	-	-	-	-	-
E2	34.3	31.8	34.0	31.7	33.1	29.4	32.0	30.1	27.1	43.3	28.4	47.6
E3	34.3	26.3	34.3	27.4	30.7	25.2	33.7	25.8	24.6	30.6	20.3	29.6
E4	38.7	33.8	37.5	35.3	35.3	34.2	37.8	33.5	-	-	-	-
E5	88.3	88.5	88.5	72.7	84.2	75.5	77.3	76.8	-	-	-	-
E6	-	-	-	-	-	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	35.0	30.1	35.6	31.1	32.7	29.0	32.1	29.0	23.7	36.9	21.8	36.0
E4&5	78.7	79.6	80.6	66.1	78.1	71.3	73.3	73.3	-	-	-	-
E6,7, &8	-	-	-	-	-	-	-	-	-	-	-	-
Christmas Tree	61.1	62.2	63.9	48.9	62.2	58.3	62.2	62.2	19.4	35.0	16.7	26.7
Mixed Vapor	44.4	42.2	46.1	32.2	44.4	40.6	46.1	45.6	18.3	37.8	18.3	35.0

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	5/21/94	5/22/94	5/22/94	5/23/94	5/23/94	5/24/94	5/24/94	5/25/94	5/25/94	5/26/94	5/26/94	5/27/94
Time	18:03	8:56	17:43	8:30	18:41	9:13	16:44	9:54	16:14	8:06	17:52	
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-0.4	-0.3	-17.0	-13.0	-0.3	-0.3	-0.2	-0.2	-0.3	-	-	
E2	-1.8	-1.3	-17.0	-13.0	-1.3	-1.1	-0.9	-0.9	-0.7	-	-	
E3	-1.8	-1.3	-18.0	-13.0	-2.5	-2.2	-2.0	-2.0	-1.6	-	-	
E4	-1.8	-1.1	-14.0	-13.0	-11.0	-10.0	-9.0	-9.0	-7.0	-12.0	-10.5	
E5	-12.0	-10.0	-14.0	-13.0	-11.0	-11.0	-8.5	-8.5	-6.5	-10.5	-10.0	
E6	-0.9	-0.6	atm.	-2.0	-0.7	-0.5	-0.7	-0.5	-0.3	-	-	
E7	-1.6	-1.4	atm.	-2.2	-1.5	-0.9	-1.4	-1.1	-0.9	-	-	
E8	atm.	atm.	atm.	-0.5	-0.3	-0.2	-0.3	-0.2	-0.2	-	-	
HE	-1.0	-0.9	1.5	-1.4	-1.2	-0.9	-0.9	-0.1	-0.7	-1.0	-0.9	
TD1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	> -0.1	0.0	0.0	> -0.1	
TD3	0.0	0.0	-1.0	-1.0	-0.7	-0.7	-0.6	-0.4	-0.5	-0.1	-0.7	
TD4	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-0.1	
TD5	-0.4	-0.3	-0.7	-0.7	-0.6	-0.5	-0.3	-0.3	-0.2	> -0.1	-0.3	
TD6	-2.0	-1.7	-2.9	-2.7	-2.1	-2.4	-1.8	-1.7	-1.3	> -0.1	-1.2	
TD7	0.0	-0.1	-0.1	-0.1	0.0	-0.6	-	-0.1	-0.1	-0.3	> -0.1	
TD8	-0.7	-0.6	-1.3	-1.1	-0.8	0.0	-	-0.6	-0.4	-0.8	-0.6	
Suction	-20.0	-21.0	-26.0	-27.0	-23.0	-21.0	-21.0	-19.0	-16.0	-21.0	-20.0	
Discharge	23.0	22.0	34.0	-33.0	28.0	23.0	21.0	22.0	19.0	24.0	24.0	
Compressor	692.0	636.7	1439.4	1218.0	885.8	747.4	636.7	609.0	498.3	650.5	650.5	
Flare	13.8	13.8	16.6	13.8	16.6	16.6	13.8	16.6	13.8	13.8	13.8	

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	53	50	60	52	50	55	50	50	45	50	50	
Flare	85	85	125	120	90	85	95	90	95	85	95	

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	117.5	119.2	122.9	122.4	130.4	133.2	138.6	135.8	139.2	139.2	142.7	
A2	171.1	136.2	127.3	181.9	180.7	168.1	159.2	142.5	136.2	123.3	116.1	

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	29.0	29.0	29.0	22.0	29.1	30.6	33.3	32.0	32.0	26.0	33.3	
E1	30.9	25.0	29.6	26.8	-	-	-	-	-	-	-	
E2	30.3	31.1	58.0	58.6	-	31.4	-	-	-	-	-	
E3	30.8	31.8	40.0	29.3	-	-	-	-	-	-	-	
E4	36.9	25.6	69.0	70.7	83.1	88.2	89.9	91.6	91.5	92.5	93.5	
E5	89.6	78.0	79.3	70.1	70.3	65.2	64.8	59.8	58.7	58.5	59.1	
E6	-	-	-	-	-	-	-	-	-	-	-	
E7	-	-	-	-	-	-	-	-	-	-	-	
E8	-	-	-	-	-	-	-	-	-	-	-	
HE	-	-	-	-	-	30.0	-	-	-	-	-	
E1,2,&3	34.0	28.7	35.0	30.3	-	-	-	-	-	-	-	
E4&5	72.8	64.8	67.3	58.8	62.7	64.6	63.4	63.2	62.5	64.8	65.9	
E6,7, &8	-	-	-	-	-	-	-	-	-	-	-	
Christmas Tree	57.8	56.7	56.7	44.4	57.2	56.7	58.9	57.8	58.3	58.3	61.1	
Mixed Vapor	45.0	43.3	43.3	37.2	45.0	46.1	46.7	46.1	46.1	42.8	46.1	

TABLE B.4
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	6/3/94	6/4/94	6/4/94	6/5/94	6/5/94	6/6/94	6/6/94	6/7/94	6/7/94	6/8/94	6/8/94	6/9/94
Time	16:20	08:52	20:58	9:05	17:55	9:10	18:10	9:22	16:54	10:08	17:58	9:19
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-0.6	-0.6		-0.6	-0.6	-0.5	-0.5	-0.5	-0.6	-0.5	-0.5	-0.5
E2	-1.7	-1.5		-1.6	-1.4	-1.5	-1.5	-1.3	-1.5	-1.7	-1.4	-1.4
E3	-1.6	-1.4		-1.4	-1.5	-1.4	-1.4	-1.4	-1.5	-1.3	-1.4	-1.4
E4	-7.0	-6.5		-6.0	-6.0	-7.5	-6.0	-6.0	-6.0	-7.0	-6.0	-5.5
E5	-8.0	-6.5		-7.0	-6.0	-6.0	-6.0	-6.0	-6.5	-5.5	-6.0	-5.5
E6	-1.1	-1.1		-1.0	-1.0	-1.0	-1.0	-1.0	-1.1	-1.0	-1.1	-1.0
E7	-1.0	-1.2		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
E8	-0.2	-0.2		-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3
HE	-0.6	-0.6		-0.7	-0.6	-0.5	-0.6	-0.5	-0.6	-0.5	-0.5	-0.5
TD1	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	>-0.1	>-0.1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
TD3	-0.8	-1.0		-0.8	-0.9	-0.7	-1.0	-0.7	-0.5	-0.7	-0.6	-0.7
TD4	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.1	>-0.1		-0.2	-0.2	-0.1	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2
TD6	-0.9	-0.5		-0.6	-0.6	-0.6	-0.7	-0.6	-0.5	-0.4	-0.5	-0.7
TD7	-0.1	>-0.1		-0.1	-0.2	>-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1
TD8	-0.5	-0.7		-0.5	-0.6	-0.5	-0.5	-0.4	-0.5	-0.5	-0.5	>-0.1
Suction	-18.0	-20.0		-27.0	-17.0	-16.0	-17.0	-23.0	-17.0	-16.0	-16.0	-15.0
Discharge	22.0	26.0		21.0	21.0	20.0	21.0	27.0	21.0	20.0	-21.0	18.0
Compressor	3543.2	802.7		775.1	830.4	775.1	802.7	802.7	830.4	775.1	830.4	775.1
Flare	16.6	16.6		16.6	13.8	16.6	16.6	16.6	13.8	16.6	13.8	13.8

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	45	45		50	45	45	45	45	45	50	50	50
Flare	95	95		95	95	95	95	85	95	95	95	95

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	106.0	99.3		90.9	88.5	83.9	82.3	74.4	73.7	69.9	68.6	66.1
A2	116.6	115.9		123.5	130.3	135.5	135.4	117.2	113.7	107.0	110.9	103.6

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	33.0	25.0		26.0	35.0	30.0	35.0	31.0	37.0	32.0	37.0	29.0
E1	-	-		-	-	-	-	-	-	-	-	-
E2	-	-		-	-	-	-	-	-	-	-	-
E3	-	-		-	-	-	-	-	-	-	-	-
E4	57.7	55.0		52.5	54.1	51.2	51.7	49.4	50.5	50.0	50.2	48.0
E5	68.4	67.6		71.2	73.6	71.7	76.8	71.3	77.3	74.2	76.8	70.5
E6	-	-		-	-	-	-	-	-	-	-	-
E7	-	-		-	-	-	-	-	-	-	-	-
E8	-	-		-	-	-	-	-	-	-	-	-
HE	-	-		-	-	-	-	-	-	-	-	-
E1,2,&3	-	-		-	-	-	-	-	-	-	-	-
E4&5	61.3	65.1		67.7	68.1	66.7	66.9	64.9	67.2	66.7	66.6	66.2
E6,7, &8	-	-		-	-	-	-	-	-	-	-	-
Christmas Tree	62.8	62.8		69.4	65.6	65.6	62.8	62.8	63.9	62.8	62.8	62.8
Mixed Vapor	51.7	57.2		51.7	54.4	51.7	48.9	51.7	57.2	54.4	51.7	51.7

TABLE B.4.
OPERATING CONDITIONS
KAI DEMONSTRATION

Vapor Extracti

Date	6/15/94	6/15/94	6/16/94	6/16/94	6/17/94	6/17/94	6/18/94	6/18/94	6/19/94	6/19/94	6/20/94	6/20/94
Time	8:52	19:14	0:00	17:20	7:19	18:12	7:27	18:29	8:37	16:34	8:25	16:31
Well Number	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)	Pressure (° H2O)
E1	-8.0	-12.0	-7.0	-11.0	-7.0	-9.0	-6.0	-11.0	-5.0	-7.0	-6.0	-7.0
E2	-8.0	-12.0	-7.0	-12.0	-7.0	-10.0	-6.0	-12.0	-5.0	-7.0	-6.0	-7.0
E3	-8.0	-12.0	-7.0	-12.0	-7.0	-10.0	-6.0	-12.0	-7.0	-7.0	-6.0	-7.0
E4	-1.4	-2.2	-1.3	-1.8	-1.2	-1.4	-1.1	-1.6	-0.8	-0.9	-1.0	-0.9
E5	-1.5	-2.2	-1.4	-1.8	-1.2	-1.4	-1.1	-1.6	-1.0	-0.8	-1.0	-0.9
E6	-1.0	-2.0	-1.5	-1.7	-1.2	-1.4	-1.0	-1.6	-1.0	-0.9	-0.9	-1.0
E7	-1.0	-1.5	-1.3	-1.2	-0.8	-1.0	-0.7	-1.0	-0.7	-0.6	-0.7	-0.6
E8	-1.0	-2.6	0.0	-2.0	-1.4	-1.5	-1.3	-1.8	-1.3	-0.9	-1.0	-1.0
HE	-0.3	-0.5	0.0	-0.5	-0.3	-0.3	-0.2	0.4	-0.2	-0.2	-0.2	-0.2
TD1	0.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD3	-1.5	-1.7	-1.0	-1.3	-0.8	-1.0	-0.8	-1.2	-0.8	-0.7	-0.3	-0.6
TD4	0.0	0.0	>-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TD5	-0.4	-0.5	-0.5	-0.4	-0.3	-0.3	-0.2	-0.3	-0.2	-0.4	0.0	0.1
TD6	-1.9	-1.6	-1.3	-1.5	-1.1	-1.0	-0.9	-1.3	-0.9	-0.6	-0.1	-0.5
TD7	-0.2	-0.2	-0.1	-0.2	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1	-0.2	-0.2
TD8	-0.7	-0.8	-0.6	-0.6	-0.4	-0.5	-0.3	-0.6	-0.4	-0.3	-0.3	-0.2
Suction	-17.0	-17.0	-16.0	-16.0	-15.0	-14.0	-13.0	-17.0	-9.0	-9.0	-12.0	-10.0
Discharge	21.0	23.0	24.0	21.0	19.0	18.0	17.0	22.0	12.0	13.0	16.0	13.0
Compressor	747.4	747.4	609.0	581.3	581.3	581.3	747.4	498.3	304.5	387.5	387.5	387.5
Flare	13.8	13.8	13.8	13.8	11.1	11.1	8.3	8.3	11.1	11.1	11.1	11.1

Flow Rates

Flow Meter	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)	Flow Rate (SCFM)
Compressor	50	50	50	45	50	50	50	50	40	40	40	60
Flare	85	100	80	85	75	80	75	85	70	70	70	65

Radio Freque

Antenna	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
A1	53.8	52.2	51.4	51.3	50.2	49.6	49.0	48.8	48.0	47.6	46.9	46.7
A2	101.5	99.9	96.1	93.7	89.8	87.6	84.6	83.3	80.6	79.5	77.1	76.6

Temperatures

Location	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)	Temp. (C)
Ambient	26.0	25.0	25.0	32.0	24.0	35.0	25.0	35.0	27.0	26.0	27.0	34.0
E1	30.2	31.4	29.7	34.8	30.5	36.6	31.6	36.4	33.1	34.2	31.1	36.4
E2	39.7	39.8	39.3	42.7	38.4	42.4	38.7	41.8	38.7	39.9	37.8	41.4
E3	40.8	41.5	39.8	42.4	39.1	42.5	39.2	42.8	39.3	38.2	38.1	41.0
E4	33.5	36.0	33.8	43.6	36.1	43.2	31.8	46.1	34.5	36.0	29.6	-
E5	37.5	40.1	33.6	40.0	35.6	42.0	34.2	42.0	35.7	38.3	32.5	-
E6	-	-	-	-	-	-	-	-	-	-	-	-
E7	-	-	-	-	-	-	-	-	-	-	-	-
E8	-	-	-	-	-	-	-	-	-	-	-	-
HE	-	-	-	-	-	-	-	-	-	-	-	-
E1,2,&3	32.1	33.2	31.8	36.7	32.1	38.8	32.7	38.6	33.3	31.6	32.3	38.1
E4&5	-	-	-	-	-	-	-	-	-	-	-	-
E6,7,&8	-	-	-	-	-	-	-	-	-	-	-	-
Christmas Tree	31.1	25.6	30.0	36.1	30.0	38.3	30.0	38.3	30.6	29.4	30.6	34.4
Mixed Vapor	26.7	26.1	25.6	38.3	25.6	41.7	26.7	41.1	29.4	26.7	29.4	40.6

9
AI
KRF-A1-U0002
0 - 2

9
AI
KRF-A1-U1618
16 - 18

9
AI
KRF-A1-U1618D
16 - 18

9
AI
KRF-A1-U1820
18 - 20

PARAMETER

W8240 - Volatile Organics, cont. (ug/kg)

6.23 B	(1)	NA	NA	NA	NA	ND	(4960)	[1000]
Methylene Chloride	[1]	NA	NA	NA	NA	ND	(2110)	[1000]
Styrene	[1]	NA	NA	NA	NA	ND	(3180)	[1000]
Tetrachloroethene	[1]	NA	NA	NA	NA	ND	(1850)	[1000]
Toluene	[1]	NA	NA	NA	NA	ND	(2520)	[1000]
Tribromomethane(Bromoform)	[1]	NA	NA	NA	NA	ND	(2390)	[1000]
Trichloroethene	[1]	NA	NA	NA	NA	ND	(3620)	[1000]
Vinyl Chloride	[1]	NA	NA	NA	NA	ND	(1460)	[1000]
Vinyl acetate	[1]	NA	NA	NA	NA	ND	(5750)	[1000]
Xylene (total)	[1]	NA	NA	NA	NA	ND	(2180)	[1000]
cis-1,3-Dichloropropene	[1]	NA	NA	NA	NA	ND	(2100)	[1000]
trans-1,2-Dichloroethene	[1]	NA	NA	NA	NA	ND	(2340)	[1000]
trans-1,3-Dichloropropene	[1]	NA	NA	NA	NA	ND		

W8270 - Semivolatile Organics (ug/g)

1,2,4-Trichlorobenzene	(0.0181)	NA	NA	NA	NA	ND	(0.539)	[1]
1,2-Dichlorobenzene	(0.0253)	NA	NA	NA	NA	ND	(0.753)	[1]
1,3-Dichlorobenzene	(0.023)	NA	NA	NA	NA	ND	(0.685)	[1]
1,4-Dichlorobenzene	(0.0301)	NA	NA	NA	NA	ND	(0.897)	[1]
2,4,5-Trichlorophenol	(0.0226)	NA	NA	NA	NA	ND	(0.674)	[1]
2,4,6-Trichlorophenol	(0.027)	NA	NA	NA	NA	ND	(0.803)	[1]
2,4-Dichlorophenol	(0.0358)	NA	NA	NA	NA	ND	(1.07)	[1]
2,4-Dimethylphenol	(0.0332)	NA	NA	NA	NA	ND	(0.989)	[1]
2,4-Dinitrophenol	(0.0461)	NA	NA	NA	NA	ND	(1.37)	[1]
2,4-Dinitrotoluene	(0.0281)	NA	NA	NA	NA	ND	(0.838)	[1]
2,6-Dinitrotoluene	(0.0307)	NA	NA	NA	NA	ND	(0.914)	[1]
2-Chloronaphthalene	(0.027)	NA	NA	NA	NA	ND	(0.805)	[1]
2-Chlorophenol	(0.0233)	NA	NA	NA	NA	ND	(0.694)	[1]
2-Methylnaphthalene	(0.0239)	NA	NA	NA	NA	ND	(0.712)	[1]
2-Methylphenol	(0.0129)	NA	NA	NA	NA	ND	(0.385)	[1]
2-Nitroaniline	(0.0304)	NA	NA	NA	NA	ND	(0.905)	[1]
2-Nitrophenol	(0.0305)	NA	NA	NA	NA	ND	(0.909)	[1]
3,3'-Dichlorobenzidine	(0.0368)	NA	NA	NA	NA	ND	(1.1)	[1]
3-Nitroaniline	(0.032)	NA	NA	NA	NA	ND	(0.955)	[1]
4,6-Dinitro-2-methylphenol	(0.0404)	NA	NA	NA	NA	ND	(1.2)	[1]
4-Bromophenyl phenyl ether	(0.0172)	NA	NA	NA	NA	ND	(0.514)	[1]
4-Chloro-3-methylphenol	(0.0165)	NA	NA	NA	NA	ND	(0.491)	[1]

Compiled: 22 June 1994

() = Detection Limit □ = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to M Report

PARAMETER	9 A1		9 A2		9 A2		9 A2	
	KRF-A1-U2728 27 - 28	KRF-A2-U0002 0 - 2	KRF-A2-U0204 2 - 4	KRF-A2-U0406 4 - 6				
2240 - Volatile Organics, cont. (ug/kg)								
trans-1,2-Dichloroethene	ND	(178)	ND	(2.42)	[1]	ND	(2.46)	ND
trans-1,3-Dichloropropene	ND	(199)	ND	(1.8)	[1]	ND	(1.83)	ND
2270 - Semivolatile Organics (ug/g)								
2,4-Trichlorobenzene	ND	(0.433)	ND	(0.018)	[1]	ND	(0.0186)	ND
2-Dichlorobenzene	ND	(0.605)	ND	(0.0252)	[1]	ND	(0.0259)	ND
3-Dichlorobenzene	ND	(0.551)	ND	(0.0229)	[1]	ND	(0.0236)	ND
4-Dichlorobenzene	ND	(0.721)	ND	(0.03)	[1]	ND	(0.0309)	ND
4,5-Trichlorophenol	ND	(0.542)	ND	(0.0226)	[1]	ND	(0.0232)	ND
4,6-Trichlorophenol	ND	(0.645)	ND	(0.0269)	[1]	ND	(0.0277)	ND
4-Dichlorophenol	ND	(0.857)	ND	(0.0357)	[1]	ND	(0.0367)	ND
4-Dimethylphenol	ND	(0.795)	ND	(0.0331)	[1]	ND	(0.0341)	ND
4-Dinitrophenol	ND	(1.1)	ND	(0.0459)	[1]	ND	(0.0473)	ND
4-Dinitrotoluene	ND	(0.674)	ND	(0.028)	[1]	ND	(0.0289)	ND
6-Dinitrotoluene	ND	(0.734)	ND	(0.0306)	[1]	ND	(0.0315)	ND
Chloronaphthalene	ND	(0.647)	ND	(0.0269)	[1]	ND	(0.0277)	ND
Chlorophenol	ND	(0.557)	ND	(0.0232)	[1]	ND	(0.0239)	ND
Methylnaphthalene	1.19	(0.572)	0.0316	(0.0238)	[1]	ND	(0.0245)	ND
Methylphenol	ND	(0.309)	ND	(0.0129)	[1]	ND	(0.0133)	ND
Nitroaniline	ND	(0.727)	ND	(0.0303)	[1]	ND	(0.0312)	ND
Nitrophenol	ND	(0.73)	ND	(0.0304)	[1]	ND	(0.0313)	ND
3'-Dichlorobenzidine	ND	(0.882)	ND	(0.0367)	[1]	ND	(0.0378)	ND
Nitroaniline	ND	(0.767)	ND	(0.0319)	[1]	ND	(0.0329)	ND
6-Dinitro-2-methylphenol	ND	(0.968)	ND	(0.0403)	[1]	ND	(0.0415)	ND
Bromophenyl phenyl ether	ND	(0.413)	ND	(0.0172)	[1]	ND	(0.0177)	ND
Chloro-3-methylphenol	ND	(0.394)	ND	(0.0164)	[1]	ND	(0.0169)	ND
Chlorophenyl phenyl ether	ND	(0.461)	ND	(0.0152)	[1]	ND	(0.0198)	ND
Methylphenol/3-Methylphenol	ND	(0.359)	ND	(0.015)	[1]	ND	(0.0154)	ND
Nitroaniline	ND	(1.07)	ND	(0.0447)	[1]	ND	(0.046)	ND
Nitrophenol	ND	(1.14)	ND	(0.0475)	[1]	ND	(0.049)	ND
Benaphthene	ND	(0.63)	0.0475	(0.0262)	[1]	0.0502	(0.027)	ND
Benaphthylene	ND	(0.624)	ND	(0.026)	[1]	ND	(0.0267)	ND
Anthracene	ND	(0.752)	0.0711	(0.0313)	[1]	0.163	(0.0322)	< DL
benzo(a)anthracene	ND	(0.586)	0.378	(0.0244)	[1]	0.625	(0.0251)	0.173
benzo(a)pyrene	ND	(0.783)	0.459	(0.0326)	[1]	0.589	(0.0336)	0.182
benzo(b)fluoranthene	ND	(1.03)	1.03 F	(0.0431)	[1]	1.12 F	(0.0444)	0.422 F

Printed: 22 Jun- 1994

() = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * = Value considered suspect. Refer to report

Filed: 22 Jun 1994

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RAHEIER	9 A2		9 A2		9 A2		9 A2					
	KRF-A2-U1012		KRF-A2-U1012D		KRF-A2-U1214		KRF-A2-U1618					
	10 - 12	10 - 12	10 - 12	10 - 12	12 - 14	16 - 18						
240 - Volatile Organics (ug/kg)												
Hydrocarbons	1290	(32.1)	[1]	571	(33.4)	[1]	622	(34.6)	[1]	23000	(622)	[20]
1,1,1-Trichloroethane	NA			NA			NA			ND	(391)	[200]
1,1,2,2-Tetrachloroethane	NA			NA			NA			ND	(799)	[200]
1,1,2-Trichloroethane	NA			NA			NA			ND	(478)	[200]
1-Dichloroethane	NA			NA			NA			ND	(458)	[200]
1-Dichloroethene	NA			NA			NA			ND	(646)	[200]
2-Dichloroethane	NA			NA			NA			ND	(681)	[200]
2-Dichloropropane	NA			NA			NA			ND	(426)	[200]
Chloroethyl vinyl ether	NA			NA			NA			ND	(247)	[200]
Hexanone	NA			NA			NA			ND	(765)	[200]
Methyl-2-Pentanone(MIBK)	NA			NA			NA			ND	(661)	[200]
Methyl acetone	NA			NA			NA			ND	(1030)	[200]
Benzene	NA			NA			NA			< DL	(891)	[200]
Monochloromethane	NA			NA			NA			ND	(567)	[200]
Dimethylmethane	NA			NA			NA			ND	(908)	[200]
Carbon disulfide	NA			NA			NA			ND	(836)	[200]
Carbon tetrachloride	NA			NA			NA			ND	(676)	[200]
Torobenzene	NA			NA			NA			29400	(539)	[200]
Toroethane	NA			NA			NA			ND	(812)	[200]
Toroform	NA			NA			NA			ND	(359)	[200]
Toromethane	NA			NA			NA			ND	(690)	[200]
Bromochloromethane	NA			NA			NA			ND	(403)	[200]
Phenyl benzene	NA			NA			NA			1120	(591)	[200]
Phenyl ethyl ketone	NA			NA			NA			ND	(1000)	[200]
Phenylene Chloride	NA			NA			NA			ND	(995)	[200]
Phenylene	NA			NA			NA			ND	(423)	[200]
Trachloroethene	NA			NA			NA			ND	(638)	[200]
Toluene	NA			NA			NA			1120	(371)	[200]
Bromomethane(Bromoform)	NA			NA			NA			ND	(505)	[200]
Chloroethene	NA			NA			NA			ND	(480)	[200]
Phenyl Chloride	NA			NA			NA			ND	(725)	[200]
Phenyl acetate	NA			NA			NA			ND	(292)	[200]
Phenene (total)	NA			NA			NA			6520	(1150)	[200]
1,3-Dichloropropene	NA			NA			NA			ND	(438)	[200]

Compiled: 22 Jan 1994

() = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to report

9
A2
KRF-A2-U1012
10 - 12

9
A2
KRF-A2-U1012D
10 - 12

9
A2
KRF-A2-U1214
12 - 14

9
A2
KRF-A2-U1618
16 - 18

PARAMETER

8270 - Semivolatile Organics, cont. (ug/g)

benzo(g,h,i)perylene	NA	NA	NA	ND X	(0.142)	(1)
benzo(k)fluoranthene	NA	NA	NA	0.172 XF	(0.138)	(1)
benzoic acid	NA	NA	NA	ND	(3.28)	(1)
benzyl alcohol	NA	NA	NA	ND	(0.0677)	(1)
butylbenzylphthalate	NA	NA	NA	ND	(0.229)	(1)
chrysene	NA	NA	NA	0.196	(0.125)	(1)
1-n-octylphthalate	NA	NA	NA	ND X	(0.0648)	(1)
benz(a,h)anthracene	NA	NA	NA	ND X	(0.126)	(1)
benzofuran	NA	NA	NA	ND	(0.0696)	(1)
butylphthalate	NA	NA	NA	0.147	(0.0622)	(1)
ethylphthalate	NA	NA	NA	ND	(0.0319)	(1)
methylphthalate	NA	NA	NA	ND	(0.0563)	(1)
phenylamine	NA	NA	NA	ND	(0.113)	(1)
fluoranthene	NA	NA	NA	0.562	(0.0741)	(1)
fluorene	NA	NA	NA	0.354	(0.0577)	(1)
hexachlorobenzene	NA	NA	NA	ND	(0.0693)	(1)
hexachlorobutadiene	NA	NA	NA	ND	(0.13)	(1)
hexachlorocyclopentadiene	NA	NA	NA	ND	(0.15)	(1)
hexachloroethane	NA	NA	NA	ND	(0.0694)	(1)
indeno(1,2,3-cd)pyrene	NA	NA	NA	ND X	(0.111)	(1)
bophorone	NA	NA	NA	ND	(0.0406)	(1)
Nitroso-di-n-propylamine	NA	NA	NA	ND	(0.0775)	(1)
phthalene	NA	NA	NA	1.37	(0.0971)	(1)
trobenzene	NA	NA	NA	ND	(0.0552)	(1)
pentachlorophenol	NA	NA	NA	ND	(0.12)	(1)
menanthrene	NA	NA	NA	0.907	(0.083)	(1)
phenol	NA	NA	NA	ND	(0.0468)	(1)
rene	NA	NA	NA	0.406	(0.089)	(1)
s(2-Chloroethoxy)methane	NA	NA	NA	ND	(0.0795)	(1)
s(2-Chloroethyl)ether	NA	NA	NA	ND	(0.0613)	(1)
s(2-Chloroisopropyl)ether	NA	NA	NA	ND	(0.0557)	(1)
s(2-Ethylhexyl)phthalate	NA	NA	NA	27.1	(0.668)	(2)
Chloroaniline	NA	NA	NA	ND	(0.118)	(1)

846 - Percent Moisture (percent)

Percent moisture	22.3	(0)	(1)	25.3	(0)	(1)	28	(0)	(1)	19.9	(0)	(1)
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Compiled: 22 June 1994

() = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to Report

9
E1
KRF-E1-U0002
0 - 2

9
A2
KRF-A2-U2628
26 - 28

9
A2
KRF-A2-U2022
20 - 22

9
A2
KRF-A2-U1618D
16 - 18

ANALYTES

140 - Volatile Organics, cont. (ug/kg)

1,1,2-Trichloroethene	ND	(106)	[50]	ND	(2200)	[1000]	NA	NA
1,1,2-Dichloroethene	ND	(119)	[50]	ND	(2460)	[1000]	NA	NA

170 - Semivolatile Organics (ug/g)

1,2,4-Trichlorobenzene	ND	(0.0553)	[1]	24.5	(5.48)	[10]	NA	NA
1,2,4-Trichlorobenzene	0.0827	(0.0772)	[1]	989	(7.66)	[10]	NA	NA
1,2,4-Trichlorobenzene	0.228	(0.0702)	[1]	58.8	(0.697)	[1]	NA	NA
1,2,4-Trichlorobenzene	1.14	(0.0919)	[1]	118	(0.912)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0691)	[1]	ND	(0.686)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0823)	[1]	ND	(0.817)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.109)	[1]	ND	(1.08)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.101)	[1]	46.7	(1.01)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.141)	[1]	ND	(1.4)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0859)	[1]	ND	(0.852)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0936)	[1]	ND	(0.929)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0826)	[1]	ND	(0.819)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0711)	[1]	ND	(0.705)	[1]	NA	NA
1,2,4-Trichlorobenzene	1.02	(0.073)	[1]	31.4	(0.724)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0395)	[1]	7.4	(0.392)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0928)	[1]	ND	(0.92)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0932)	[1]	ND	(0.924)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.112)	[1]	ND	(1.12)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0979)	[1]	ND	(0.971)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.123)	[1]	ND	(1.22)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0527)	[1]	ND	(0.523)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0503)	[1]	ND	(0.499)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0588)	[1]	ND	(0.583)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0458)	[1]	23.2 F	(0.455)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.137)	[1]	ND	(1.36)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.146)	[1]	ND	(1.45)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0803)	[1]	ND	(0.797)	[1]	NA	NA
1,2,4-Trichlorobenzene	< DL	(0.0796)	[1]	ND	(0.789)	[1]	NA	NA
1,2,4-Trichlorobenzene	ND	(0.0959)	[1]	ND	(0.951)	[1]	NA	NA
1,2,4-Trichlorobenzene	0.0907	(0.0747)	[1]	ND	(0.741)	[1]	NA	NA
1,2,4-Trichlorobenzene	< DL	(0.0999)	[1]	ND	(0.991)	[1]	NA	NA
1,2,4-Trichlorobenzene	0.199 F	(0.132)	[1]	ND	(1.31)	[1]	NA	NA

11/22/94

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9
EI
KRF-EI-U1012
10 - 12

9
EI
KRF-EI-U1618
16 - 18

9
EI
KRF-EI-U1618D
16 - 18

9
EI
KRF-EI-U2425
24 - 25

PARAMETER

8.1.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)
3350 (285)

22,000 SD
21300

[10] [536] [20] [22900] [536] [20] [4690] [132] [5]

240 - Volatile Organics (ug/kg)

1,1,1-Trichloroethane	NA	ND	(532)	[500]	ND	(530)	[500]	ND	(1050)	[1000]
1,1,2,2-Tetrachloroethane	NA	ND	(692)	[500]	ND	(690)	[500]	ND	(1370)	[1000]
1,1,2-Trichloroethane	NA	ND	(525)	[500]	ND	(524)	[500]	ND	(1040)	[1000]
1-Dichloroethane	NA	ND	(417)	[500]	ND	(416)	[500]	ND	(825)	[1000]
1-Dichloroethane	NA	ND	(1030)	[500]	ND	(1030)	[500]	ND	(2040)	[1000]
2-Dichloroethane	NA	ND	(762)	[500]	ND	(760)	[500]	ND	(1510)	[1000]
2-Dichloropropane	NA	ND	(1440)	[500]	ND	(1430)	[500]	ND	(2850)	[1000]
Chloroethyl vinyl ether	NA	ND	(762)	[500]	ND	(760)	[500]	ND	(1510)	[1000]
Hexanone	NA	ND	(842)	[500]	ND	(840)	[500]	ND	(1670)	[1000]
Methyl-2-Pentanone(MIBK)	NA	ND	(569)	[500]	ND	(567)	[500]	ND	(1130)	[1000]
Petone	NA	< DL	(3150)	[500]	< DL	(3140)	[500]	< DL	(6230)	[1000]
Benzene	NA	923	(352)	[500]	1590	(352)	[500]	< DL	(698)	[1000]
Bromochloromethane	NA	ND	(1930)	[500]	ND	(1920)	[500]	ND	(3810)	[1000]
Bromomethane	NA	ND	(992)	[500]	ND	(990)	[500]	ND	(1960)	[1000]
Carbon disulfide	NA	ND	(789)	[500]	ND	(787)	[500]	ND	(1560)	[1000]
Carbon tetrachloride	NA	ND	(778)	[500]	ND	(776)	[500]	ND	(1540)	[1000]
Torobenzene	NA	55500	(542)	[500]	70500	(541)	[500]	94900	(1070)	[1000]
Toroethane	NA	ND	(724)	[500]	ND	(722)	[500]	ND	(1430)	[1000]
Toroform	NA	ND	(323)	[500]	ND	(322)	[500]	ND	(639)	[1000]
Toromethane	NA	ND	(524)	[500]	< DL	(522)	[500]	ND	(1040)	[1000]
Bromochloromethane	NA	ND	(380)	[500]	ND	(379)	[500]	ND	(753)	[1000]
Thyl benzene	NA	ND	(590)	[500]	ND	(589)	[500]	< DL	(1170)	[1000]
Thyl ethyl ketone	NA	1720 B	(1480)	[500]	1720 B	(1480)	[500]	3550 B	(2930)	[1000]
Thylene Chloride	NA	3440	(992)	[500]	1170	(990)	[500]	2430	(1960)	[1000]
Thylene	NA	ND	(579)	[500]	ND	(578)	[500]	ND	(1150)	[1000]
Trachloroethene	NA	ND	(783)	[500]	ND	(781)	[500]	ND	(1550)	[1000]
Thene	NA	ND	(432)	[500]	ND	(431)	[500]	4690	(855)	[1000]
Bromomethane(Bromoform)	NA	ND	(260)	[500]	ND	(259)	[500]	ND	(514)	[1000]
Chloroethene	NA	ND	(837)	[500]	ND	(835)	[500]	ND	(1660)	[1000]
Thyl Chloride	NA	ND	(660)	[500]	ND	(658)	[500]	ND	(1310)	[1000]
Thyl acetate	NA	ND	(440)	[500]	ND	(439)	[500]	ND	(871)	[1000]
ene (total)	NA	ND	(1360)	[500]	ND	(1360)	[500]	7260	(2700)	[1000]
1,3-Dichloropropene	NA	ND	(291)	[500]	ND	(290)	[500]	ND	(576)	[1000]

illed: 22 June 1994

() = Detection Limit

□ = Dilution Factor

ND = Not Detected

NA = Not Applicable

* - Value considered suspect, Refer to Report

9
E1
KRF-E1-U1012
10 - 12

9
E1
KRF-E1-U1618
16 - 18

9
E1
KRF-E1-U16180
16 - 18

9
E1
KRF-E1-U2425
24 - 25

ANETER

70 - Semivolatile Organics, cont. (ug/g)

NA	ND	[1]	ND X	(0.122)	[1]	ND	(1.12)	[1]
2-(g,h,i)perylene	0.216 F	[1]	0.305 XF	(0.119)	[1]	ND	(1.09)	[1]
2-(k)fluoranthene	ND	[1]	ND	(2.81)	[1]	ND	(25.9)	[1]
2-oxo acid	ND	[1]	ND	(0.0581)	[1]	ND	(0.535)	[1]
2-phenyl alcohol	ND	[1]	< DL	(0.197)	[1]	ND	(1.81)	[1]
2-phenylphthalate	0.203	[1]	0.233	(0.107)	[1]	ND	(0.985)	[1]
2-phenylene	ND	[1]	ND Y	(0.0556)	[1]	ND	(0.512)	[1]
2-n-octylphthalate	ND	[1]	ND X	(0.108)	[1]	ND	(0.995)	[1]
2-benz(a,h)anthracene	ND	[1]	ND X	(0.0598)	[1]	ND	(0.551)	[1]
2-benzofuran	0.612	[1]	0.677	(0.0534)	[1]	ND	(0.492)	[1]
2-ethylphthalate	ND X	[1]	ND X	(0.0274)	[1]	ND	(0.252)	[1]
2-ethylphthalate	ND X	[1]	ND X	(0.0483)	[1]	ND	(0.445)	[1]
2-phenylamine	ND	[1]	ND	(0.0971)	[1]	ND	(0.894)	[1]
2-phenanthrene	3.1	[1]	3.84	(0.0636)	[1]	0.664	(0.586)	[1]
2-phenylene	ND X	[1]	ND X	(0.0495)	[1]	ND	(0.456)	[1]
2-chlorobenzene	0.171	[1]	ND	(0.0595)	[1]	ND	(0.548)	[1]
2-chlorobutadiene	ND	[1]	ND	(0.111)	[1]	ND	(1.02)	[1]
2-chlorocyclopentadiene	ND X	[1]	ND X	(0.128)	[1]	ND	(1.18)	[1]
2-chloroethane	ND	[1]	ND	(0.0596)	[1]	ND	(0.549)	[1]
2-methyl-2,3-cd)pyrene	ND	[1]	ND X	(0.0953)	[1]	ND	(0.878)	[1]
2-benzofuran	ND	[1]	ND	(0.0349)	[1]	ND	(0.321)	[1]
2-benzodioxole	ND	[1]	ND	(0.0665)	[1]	ND	(0.613)	[1]
2-benzodioxole	ND	[1]	ND	(0.0833)	[1]	2.97	(0.767)	[1]
2-benzodioxole	ND	[1]	ND	(0.0474)	[1]	ND	(0.436)	[1]
2-benzodioxole	ND	[1]	ND	(0.103)	[1]	ND	(0.947)	[1]
2-benzodioxole	1.46	[1]	1.63	(0.0712)	[1]	ND	(0.656)	[1]
2-benzodioxole	ND	[1]	ND	(0.0402)	[1]	ND	(0.37)	[1]
2-benzodioxole	0.736	[1]	0.785	(0.0763)	[1]	ND	(0.703)	[1]
2-benzodioxole	ND	[1]	ND	(0.0682)	[1]	ND	(0.629)	[1]
2-benzodioxole	ND	[1]	ND	(0.0526)	[1]	ND	(0.485)	[1]
2-benzodioxole	ND	[1]	ND	(0.0478)	[1]	ND	(0.44)	[1]
2-benzodioxole	25.9	[5]	26.1	(1.43)	[5]	3.61	(2.64)	[1]
2-benzodioxole	ND	[1]	ND	(0.101)	[1]	ND	(0.934)	[1]

- Percent Moisture (percent)

Percent moisture

12.5	(0)	[1]	6.89	(0)	[1]	7.13	(0)	[1]	6.01	(0)	[1]
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led: 22 June 1994

() = Detection Limit

□ = Dilution Factor

ND = Not Detected

NA = Not Applicable

* - Value considered suspect, Refer to report

PARAMETER	9 E3		9 E3		9 E3		9 E4					
	KRF-E3-U1618 16 - 18	KRF-E3-U2022 20 - 22	KRF-E3-U2829 28 - 29	KRF-E4-U0709 7 - 9								
18.1 - Total Recoverable Petroleum Hydrocarbons	7410	(157)	(5)	1360	(33.3)	[1]	325	(26.5)	[1]	1310	(29.7)	[1]
Hydrocarbons												
B240 - Volatile Organics (ug/kg)												
1,1,1-Trichloroethane	ND	(125)	[100]	ND	(13100)	[10000]	NA			NA		NA
1,1,2,2-Tetrachloroethane	ND	(163)	[100]	ND	(17100)	[10000]	NA			NA		NA
1,1,2,2-Trichloroethane	ND	(123)	[100]	ND	(13000)	[10000]	NA			NA		NA
1,1-Dichloroethane	ND	(98)	[100]	ND	(10300)	[10000]	NA			NA		NA
1,1-Dichloroethene	ND	(242)	[100]	ND	(25500)	[10000]	NA			NA		NA
2,2-Dichloroethane	ND	(179)	[100]	ND	(18800)	[10000]	NA			NA		NA
2,2-Dichloropropane	ND	(338)	[100]	ND	(35500)	[10000]	NA			NA		NA
Chloroethyl vinyl ether	ND	(179)	[100]	ND	(18800)	[10000]	NA			NA		NA
Hexanone	ND	(198)	[100]	ND	(20800)	[10000]	NA			NA		NA
Methyl-2-Pentanone(MIBK)	ND	(134)	[100]	ND	(14100)	[10000]	NA			NA		NA
Petone	< DL	(740)	[100]	ND	(77900)	[10000]	NA			NA		NA
Benzene	ND	(82.8)	[100]	ND	(8710)	[10000]	NA			NA		NA
Monodichloromethane	ND	(453)	[100]	ND	(47600)	[10000]	NA			NA		NA
Monomethane	ND	(233)	[100]	ND	(24500)	[10000]	NA			NA		NA
Carbon disulfide	ND	(185)	[100]	ND	(19500)	[10000]	NA			NA		NA
Carbon tetrachloride	ND	(183)	[100]	ND	(19200)	[10000]	NA			NA		NA
Chlorobenzene	8440	(127)	[100]	< DL	(13400)	[10000]	NA			NA		NA
Chloroethane	ND	(170)	[100]	ND	(17900)	[10000]	NA			NA		NA
Chloroform	ND	(75.9)	[100]	ND	(7980)	[10000]	NA			NA		NA
Chloromethane	ND	(123)	[100]	< DL	(12900)	[10000]	NA			NA		NA
Bromochloromethane	ND	(89.4)	[100]	ND	(9400)	[10000]	NA			NA		NA
Ethyl benzene	< DL	(139)	[100]	< DL	(14600)	[10000]	NA			NA		NA
Ethyl ethyl ketone	467 8	(348)	[100]	ND	(36600)	[10000]	NA			NA		NA
Ethylene Chloride	339	(233)	[100]	35100	(24500)	[10000]	NA			NA		NA
Ethylene	ND	(136)	[100]	ND	(14300)	[10000]	NA			NA		NA
Tetrachloroethene	ND	(184)	[100]	ND	(19400)	[10000]	NA			NA		NA
Bluene	ND	(102)	[100]	80600	(10700)	[10000]	NA			NA		NA
Bromomethane(Bromoform)	ND	(61)	[100]	ND	(6420)	[10000]	NA			NA		NA
Trichloroethene	ND	(197)	[100]	ND	(20700)	[10000]	NA			NA		NA
Nyl Chloride	ND	(155)	[100]	ND	(16300)	[10000]	NA			NA		NA
Nyl acetate	ND	(103)	[100]	ND	(10900)	[10000]	NA			NA		NA
Nylene (total)	ND	(320)	[100]	89900	(33700)	[10000]	NA			NA		NA
s-1,3-Dichloropropene	ND	(68.3)	[100]	ND	(7190)	[10000]	NA			NA		NA

Compiled: 22 Jir 1994

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9
E3
KRF-E3-U1618
16 - 18

9
E3
KRF-E3-U2022
20 - 22

9
E3
KRF-E3-U2829
28 - 29

9
E4
KRF-E4-U0709
7 - 9

PARAMETER

270 - Semivolatile Organics, cont. (ug/g)

nzo(g,h,i)perylene	ND	(0.083)	[1]	< DL	(0.82)	[1]	NA	NA
nzo(k)fluoranthene	< DL	(0.108)	[1]	< DL	(1.07)	[1]	NA	NA
nzoic acid	ND	(0.74)	[1]	ND	(7.3)	[1]	NA	NA
nzy alcohol	ND	(0.0746)	[1]	ND	(0.736)	[1]	NA	NA
tylbenzylphthalate	ND	(0.117)	[1]	< DL	(2.14)	[1]	NA	NA
rysene	< DL	(0.094)	[1]	< DL	(0.882)	[1]	NA	NA
n-octylphthalate	ND	(0.0979)	[1]	ND	(0.966)	[1]	NA	NA
benz(a,h)anthracene	ND	(0.0898)	[1]	ND	(0.886)	[1]	NA	NA
benzofuran	ND	(0.0682)	[1]	ND	(0.673)	[1]	NA	NA
butylphthalate	ND	(0.0714)	[1]	2.86	(0.705)	[1]	NA	NA
ethylphthalate	ND	(0.0467)	[1]	ND	(0.461)	[1]	NA	NA
methylphthalate	ND	(0.0488)	[1]	ND	(0.482)	[1]	NA	NA
phenylamine	ND	(0.114)	[1]	ND	(1.12)	[1]	NA	NA
uoranthene	0.278	(0.0769)	[1]	26.2	(0.759)	[1]	NA	NA
uorene	0.128	(0.0638)	[1]	3.27	(0.629)	[1]	NA	NA
xachlorobenzene	ND	(0.0865)	[1]	2.76	(0.853)	[1]	NA	NA
xachlorobutadiene	ND	(0.0904)	[1]	ND	(0.892)	[1]	NA	NA
xachlorocyclopentadiene	ND	(0.261)	[1]	ND	(2.58)	[1]	NA	NA
xachloroethane	ND	(0.103)	[1]	ND	(1.02)	[1]	NA	NA
deno(1,2,3-cd)pyrene	ND	(0.0651)	[1]	< DL	(0.643)	[1]	NA	NA
ophorone	ND	(0.0938)	[1]	ND	(0.926)	[1]	NA	NA
Nitroso-di-n-propylamine	ND	(0.0529)	[1]	ND	(0.522)	[1]	NA	NA
phthalene	0.207	(0.0778)	[1]	53.3	(0.767)	[1]	NA	NA
trobzene	ND	(0.14)	[1]	ND	(1.38)	[1]	NA	NA
ntachlorophenol	ND	(0.13)	[1]	ND	(1.28)	[1]	NA	NA
enanthrene	0.336	(0.0999)	[1]	4.79	(0.985)	[1]	NA	NA
enol	ND	(0.0408)	[1]	4.2	(0.403)	[1]	NA	NA
rene	0.113	(0.0547)	[1]	1.59	(0.54)	[1]	NA	NA
s(2-Chloroethoxy)methane	ND	(0.103)	[1]	ND	(1.01)	[1]	NA	NA
s(2-Chloroethyl)ether	ND	(0.113)	[1]	ND	(1.12)	[1]	NA	NA
s(2-Chloroisopropyl)ether	ND	(0.14)	[1]	ND	(1.38)	[1]	NA	NA
s(2-Ethylhexyl)phthalate	15.2 B	(0.183)	[1]	132 B	(1.8)	[1]	NA	NA
Chloroaniline	ND	(0.109)	[1]	ND	(1.08)	[1]	NA	NA

46 - Percent Moisture (percent)
percent moisture

20.7 (0) [1] 24.9 (0) [1] 5.94 (0) [1] 16 (0) [1]

Compiled: 22 June 1994

() = Detection Limit [] = Dilution Factor ND = Not Detected NA = Not Applicable * - Value considered suspect, Refer to report

9
E4
KRF-E4-U0911
9 - 11

9
E4
KRF-E4-U2426
24 - 26

9
E5
KRF-E5-U0406
4 - 6

9
E5
KRF-E5-U0608
6 - 8

PARAMETER

3240 - Volatile Organics, cont. (ug/kg)

trans-1,2-Dichloroethene	ND	(2.28)	[1]	ND	(1810)	[1000]	ND	(2.32)	[1]	ND	(2.31)	[1]
trans-1,3-Dichloropropene	ND	(1.7)	[1]	ND	(1590)	[1000]	ND	(1.73)	[1]	ND	(1.72)	[1]

3270 - Semivolatile Organics (ug/g)

2,4-Trichlorobenzene	ND	XY	(0.065)	[5]	0.248	(0.0927)	[1]	ND	(0.0348)	[1]	ND	(0.0345)	[1]
2-Dichlorobenzene	ND	XY	(0.121)	[5]	1.24	(0.0784)	[5]	ND	(0.0295)	[1]	0.045	(0.0292)	[1]
3-Dichlorobenzene	ND	XY	(0.11)	[5]	2.63	(0.0477)	[5]	ND	(0.0179)	[1]	ND	(0.0177)	[1]
4-Dichlorobenzene	ND	XY	(0.144)	[5]	17.9	(0.149)	[5]	ND	(0.0281)	[1]	ND	(0.0278)	[1]
4,5-Trichlorophenol	ND	XY	(0.108)	[5]	ND	(0.0743)	[5]	ND	(0.028)	[1]	ND	(0.0277)	[1]
4,6-Trichlorophenol	ND	XY	(0.129)	[5]	ND	(0.0535)	[5]	ND	(0.0201)	[1]	ND	(0.0199)	[1]
4-Dichlorophenol	ND	XY	(0.171)	[5]	ND	(0.0239)	[5]	ND	(0.009)	[1]	ND	(0.00891)	[1]
4-Dimethylphenol	ND	XY	(0.159)	[5]	ND	(0.0934)	[5]	ND	(0.0351)	[1]	ND	(0.0348)	[1]
4-Dinitrophenol	ND	XY	(0.22)	[5]	ND	(0.297)	[5]	ND	(0.111)	[1]	ND	(0.11)	[1]
4-Dinitrotoluene	ND	XY	(0.134)	[5]	ND	(0.0532)	[5]	ND	(0.02)	[1]	ND	(0.0198)	[1]
6-Dinitrotoluene	ND	XY	(0.147)	[5]	ND	(0.0838)	[5]	ND	(0.0315)	[1]	ND	(0.0312)	[1]
Chloronaphthalene	ND	XY	(0.129)	[5]	ND	(0.122)	[5]	ND	(0.0458)	[1]	ND	(0.0454)	[1]
Chlorophenol	ND	XY	(0.111)	[5]	ND	(0.0717)	[5]	ND	(0.027)	[1]	ND	(0.0267)	[1]
Methylnaphthalene	ND	XY	(0.114)	[5]	6.13	(0.0772)	[5]	ND	(0.029)	[1]	< DL	(0.0288)	[1]
Methylphenol	ND	XY	(0.0618)	[5]	ND	(0.0673)	[5]	ND	(0.0253)	[1]	ND	(0.0251)	[1]
Nitroaniline	ND	XY	(0.145)	[5]	ND	(0.122)	[5]	ND	(0.0458)	[1]	ND	(0.0454)	[1]
Nitrophenol	ND	XY	(0.146)	[5]	ND	(0.0732)	[5]	ND	(0.0275)	[1]	ND	(0.0273)	[1]
3'-Dichlorobenzidine	ND	XY	(0.176)	[5]	ND	(0.0571)	[5]	ND	(0.0215)	[1]	ND	(0.0213)	[1]
Nitroaniline	ND	XY	(0.153)	[5]	ND	(0.0911)	[5]	ND	(0.0342)	[1]	ND	(0.0339)	[1]
6-Dinitro-2-methylphenol	ND	XY	(0.193)	[5]	ND	(0.103)	[5]	ND	(0.0389)	[1]	ND	(0.0385)	[1]
Bromophenyl phenyl ether	ND	XY	(0.0824)	[5]	ND	(0.0933)	[5]	ND	(0.0351)	[1]	ND	(0.0347)	[1]
Chloro-3-methylphenol	ND	XY	(0.0787)	[5]	ND	(0.0704)	[5]	ND	(0.0265)	[1]	ND	(0.0262)	[1]
Chlorophenyl phenyl ether	ND	XY	(0.092)	[5]	ND	(0.0608)	[5]	ND	(0.0229)	[1]	ND	(0.0226)	[1]
Methylphenol/3-Methylphenol	ND	XY	(0.0717)	[5]	ND	(0.0464)	[5]	ND	(0.0174)	[1]	ND	(0.0173)	[1]
Nitroaniline	ND	XY	(0.214)	[5]	ND	(0.115)	[5]	ND	(0.0434)	[1]	ND	(0.043)	[1]
Nitrophenol	ND	XY	(0.228)	[5]	ND	(0.295)	[5]	ND	(0.111)	[1]	ND	(0.11)	[1]
Benaphthene	ND	XY	(0.126)	[5]	ND	(0.077)	[5]	ND	(0.0289)	[1]	0.0603	(0.0287)	[1]
Benaphthylene	ND	XY	(0.125)	[5]	ND	(0.0671)	[5]	ND	(0.0252)	[1]	ND	(0.025)	[1]
Chracene	< DL	XY	(0.15)	[5]	< DL	(0.0623)	[5]	0.0297	(0.0234)	[1]	0.144	(0.0232)	[1]
benzo(a)anthracene	0.151	XY	(0.117)	[5]	< DL	(0.0583)	[5]	0.0836	(0.0219)	[1]	0.344	(0.0217)	[1]
benzo(a)pyrene	< DL	XY	(0.156)	[5]	ND	(0.0737)	[5]	0.102	(0.0277)	[1]	0.329	(0.0274)	[1]
benzo(b)fluoranthene	< DL	XY	(0.207)	[5]	ND	(0.0744)	[5]	0.244	(0.028)	[1]	0.735	(0.0277)	[1]

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9
E5
KRF-E5-UI012
10 - 12

9
E5
KRF-E5-UI214
12 - 14

9
E5
KRF-E5-UI820
18 - 20

9
E5
KRF-E5-UI2022
20 - 22

ANALYST

1.1 - Total Recoverable Petroleum Hydrocarbons (mg/kg)
668 (30.4)

5 - Percent Moisture (percent)
18 (0)

[1]

[1]

[1]

[1]

[50]

[1680]

[50]

(0)

[1]

[1]

(0)

[1]

25.6

(0)

[1]

1994

() = Detection Limit

[] = Dilution Factor

ND = Not Detected

NA = Not Applicable

* - Value considered suspect, Refer to Report